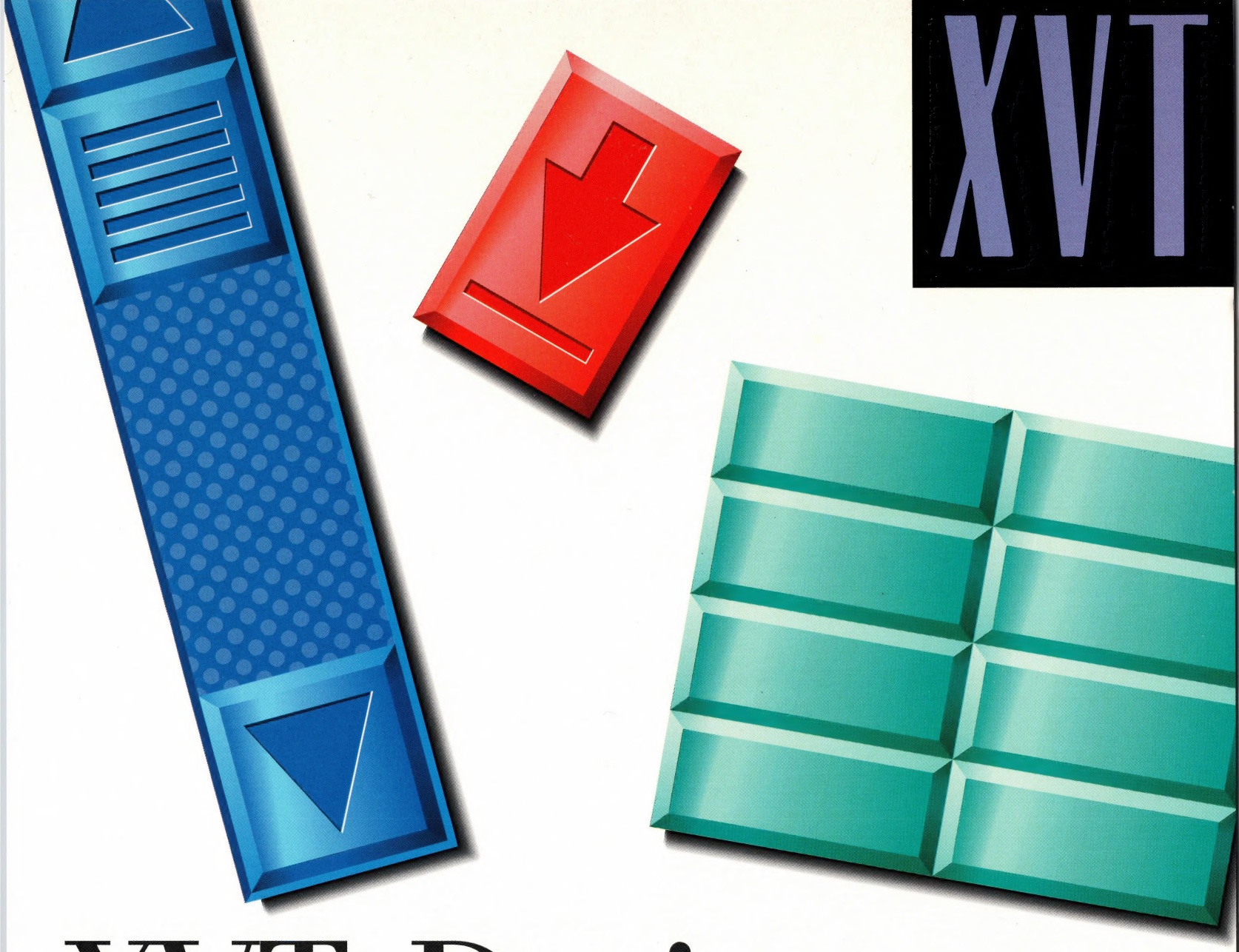


XVT-Design++™

An Interactive C++ Application Framework from the #1 Company in Multi-Platform Development Tools.

XVT

XVT-Design++

Volume 2

XVT++ 2.0 CLASS LIBRARY REFERENCE

XVT - THE PORTABLE GUI DEVELOPMENT SOLUTION

Copyrights

© 1993 XVT Software Inc. All rights reserved.

The XVT++ application program interface, XVT manuals and technical literature may not be reproduced in any form or by any means except by permission in writing from XVT Software Inc.

XVT and XVT++ are trademarks of XVT Software Inc. Other product names mentioned in this document are trademarks or registered trademarks of their respective holders.

Published By

XVT Software Inc.
Box 18750
Boulder, CO 80308
(303) 443-4223
(303) 443-0969 (fax)

Credits

Original Concept and Design
Marc Rochkind

Architecture and Specification
Scott Meyer and Jack Unrue

Engineers
Scott Meyer, Jack Unrue, Steve Archuleta

Documentation
Lynn Merrill, Scott Meyer, Dave Welsch

Product Team
Dave Locke, Scott Meyer, Peggy Reed, Connie Leserman, Catherine Connor, Jonathan Auerbach

Printing History

First printing.....March, 1993 ..... XVT++ Version 2.0

Second printing .....June, 1993 ..... XVT++ Version 2.0

This manual was printed on recycled paper
by Continental Graphics, Broomfield, Colorado.

XVT++

CONTENTS

PREFACE ..... **v**
How to Use This Manual v
XVT_Class vi
INTRODUCTION TO XVT++ **1**
Overview 1
XVT++ and the Interactive Design Tool 1
Usage 1
Handlers 2
Compatibility 3
Class Hierarchy 3
XVT++ CLASSES **5**
XVT_AllocErrorHandler 5
XVT_AllocErrorManager 8
XVT_Base 10
XVT_BaseDrawProto 15
XVT_Brush 37
XVT_Button 41
XVT_CheckBox 44
XVT_ChildBase 48
XVT_ChildWin 66
XVT_ClipBoard 72
XVT_Color 80
XVT_Config 84
XVT_Container 90
XVT_Control 92
XVT_DetachedWin 101
XVT_Dialog 108

XVT_Directory 125
XVT_DrawableContainer 127
XVT_DrawTools 150
XVT_Edit 158
XVT_Editable 161
XVT_ErrorHandler 166
XVT_ErrorManager 169
XVT_FileSpec 171
XVT_Font 175
XVT_FontMetrics 178
XVT_GlobalAPI 182
XVT_GroupBox 226
XVT_Icon 229
XVT_InternalErrorHandler 233
XVT_InternalErrorManager 236
XVT_Label 238
XVT_List 243
XVT_ListBox 253
XVT_ListButton 258
XVT_ListEdit 262
XVT_Menu 267
XVT_MenuItem 273
XVT_MenuNode 277
XVT_MenuNodeBase 281
XVT_MenuSeparator 283
XVT_MenuWin 285
XVT_Pen 295
XVT_Picture 300
XVT_Pnt 306
XVT_PrintWin 309
XVT_RadioButton 318
XVT_Rct 323
XVT_ScreenWin 333
XVT_ScrollBar 337
XVT_StaticText 346
XVT_StrList 349
XVT_SubMenu 356
XVT_TaskWin 359
XVT_TextEdit 370
XVT_Timer 390
XVT_Toggle 393
XVT_TopLevelWin 397

XVT++ 1.1 COMPATIBILITY CLASSES 407
XVT++ 1.1 to 2.0 Member Function Map 407
BaseWin 414
BaseXVT 424
Brush 432
Control 436
DlgWin 453
DrawTools 459
Font 463
GraphWin 468
MenuItem 482
Pen 486
Pnt 490
Rct 493
ScreenWin 498
StrList 509
StrListElt 517
TaskWin 518
INDEX OF EQUIVALENT C FUNCTIONS 523
GENERAL INDEX 529

PREFACE

How to Use This Manual

This reference manual lists class names in alphabetical order. Each class description follows the same format. If any section of the class description is not used for a particular class, it is omitted.

The following pages of this preface illustrate and describe the format. In addition, several typesetting conventions indicate different types of information:

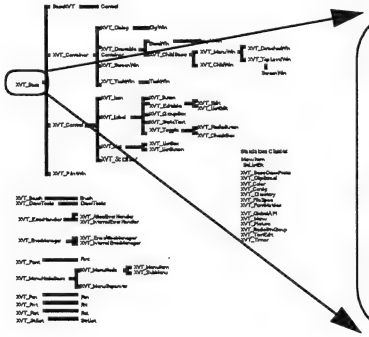
`code`
: This typestyle represents code, including expressions and the names of functions, attributes, variables, and structures.

file names
: Bold type is used for file names and extensions.

emphasis
: Italics are used for emphasis and for the names of documents.

The following pages illustrate the class description format.

XVT_Class



This diagram illustrates where the class falls in the hierarchy.

XVT_SuperClass — **XVT_Class** — XVT_SubClass1, XVT_SubClass2, XVT_SubClass3, XVT_SubClass4

Overview

Header File	The header file in which the class definition for this class can be found. You should not include this file directly; always use **xvtpp.h** to include XVT++ definitions in your application.
Source File	The source file in which the code for the class member functions is found.
Superclass	The superclass from which this class is derived. Since XVT++ does not employ multiple inheritance, each class has only one superclass.
Subclasses	Subclasses of this class.
Usage	One of the following: **Abstract**: You may create only subclasses of this class. **Concrete**: You may create both instances and subclasses of this class. **Implementation**: This class is part of the implementation of XVT++ and should be neither subclassed nor instantiated.

An overview of the class, what it does, and how to use it appears after the summary table.

Example

An example of how to use this class.

Constructors

Descriptions of class constructors and destructors; listed only for concrete and abstract classes, not for implementation classes.

Operators

A listing of any operators overloaded by this class.

Casts

A listing of virtual cast functions implemented by this class.

Member Functions

This section describes class member functions. All member functions described constitute the documented XVT++ interface. Some undocumented member functions are part of the XVT++ implementation. Use undocumented functions at your own risk; they may not work the way you expect, and they may change or disappear entirely from future releases.

Private member functions are always part of the implementation.

In some cases, subclasses override member functions provided by a superclass without changing the syntax or semantics of the member function. This is done to get around the fact that operator overloading only applies to functions in the same class, or to take advantage of pure virtual functions. In these cases, the override is not documented in the subclass, only in the superclass.

XVT_Class::FunctionName

A SHORT DESCRIPTION OF THE MEMBER FUNCTION

Prototypes

The member function prototypes.

Parameters

A description of each parameter. In the case of overloaded functions, every parameter with the same name has the same semantics and is thus described only once.

Return Value

A description of the function's return value.

Description

A general description of the member function.

`an overloaded member function`
A description of a particular overloaded member function.

Implementation Notes

Any notes on platform dependencies relating to this function.

Equivalent C Functions

A list of equivalent C functions from the XVT Portability Toolkit.

Implementation Members

A list of member functions and variables that are part of the implementation but that are not part of the interface. Do not use implementation members in your code; implementation members will not necessarily remain the same for future releases of XVT++.

Inherited Member Functions

A list of inherited member functions.

From XVT_SuperClass

page number `function prototype`

1

INTRODUCTION TO XVT++

Overview

XVT++ 2.0 provides a complete C++ interface to the functionality offered by the XVT Portability Toolkit.

XVT++ and the Interactive Design Tool

This product is designed to be used with the Interactive Design Tool (IDT). Together, the IDT and the XVT++ Class Library are called XVT-Design++. We do not recommend writing XVT++ applications without the IDT, even though it is possible (though more difficult) to do so.

XVT strongly suggests that *new* applications be produced using the IDT. We believe this is the most productive way to use our products, and XVT is best able to provide customer support using this method of application development.

Usage

A typical XVT++ application consists of a subclass of `XVT_TaskWin` and one or more subclasses of the GUI container classes: `XVT_ToplevelWin`, `XVT_DetachedWin`, and `XVT_Dialog`. Each subclass overrides whichever event handler member functions are necessary for the application to function. With the exception of menus, all GUI objects have at least `e_create` and `e_destroy` event handler member functions, which are called when the object is created and just before it is destroyed, respectively. All GUI objects, including menus, have constructor and destructor member functions. These are called when the C++ object is constructed and destroyed.

Any of the GUI container classes can contain controls and, in the case of windows, text edit objects and child windows. Like GUI containers, controls have their own event handler member functions that are overridden by user subclasses. Most controls have at least `e_create`, `e_destroy`, and `e_action` event handler member functions.

All GUI objects—controls, windows, and dialogs—have a two-phase creation protocol. The two-phase protocol prevents a problem that can occur when the window system causes recursion in a C++ constructor: callbacks from the window system can cause the application program to try to use an object that is not yet completely constructed. In the two-phase protocol, the GUI object is first created with the C++ `new` operator and then initialized with the `Init` member function. The object's `e_create` member function is called before `Init` returns.

Handlers

XVT++ 2.0 preserves the style of programming used in version 1.1: you are expected to create subclasses that override virtual event handler member functions (the `e_*` functions) to implement whatever behavior your application needs. For many applications, this scheme is satisfactory; however, there are times when other techniques are preferred.

One such situation is the case where an application has many controls or windows that are very similar, for example 50 text entry fields that collect data for a database query. Creating 50 distinct classes results in much duplicate code. A better solution is to create a single class that changes its behavior based on parameters provided in the constructor, in additional member functions, or in resource user data. You can then create 50 instances of this class, one for each control.

In other cases, the fact that all of an object's behavior must be specified in a single subclass definition causes difficulties. A symptom of this sort of problem would be subclass member functions that all start with `if` or `switch` statements, which cause the member function to behave in completely different ways based on the state of the object.

A cleaner approach is to create what are known as behavior or delegate objects. A behavior object implements a single type of behavior; it has no switch statements. The behavior of an object is

changed by replacing behavior objects instead of taking different paths through switch logic.

Tip: The simplest way to implement behaviors is to create an abstract behavior class that has member functions corresponding to the event handling member functions present in the XVT++ object. Each actual behavior will be a subclass of this behavior class.

The subclass of the XVT++ object is very simple. It adds storage for a current behavior pointer and implementations of the event handling member functions that just call the corresponding function in the current behavior. When the subclass is instantiated, it installs the behavior corresponding to the start state. As the object is manipulated, the current behavior is called and can manipulate the XVT object subclass as required, including switching the current behavior.

Compatibility

XVT++ 2.0 is fully backwards compatible with XVT++ 1.1. Most XVT++ 1.1 programs should run without modification. The exception to this rule is XVT++ 1.1 programs that rely on specific details of the 1.1 inheritance hierarchy, for example that both `DlgWin` and `ScreenWin` are subclasses of `BaseWin`. To give 1.1 applications full access to the new functionality provided by 2.0, it was necessary to have the old 1.1 classes inherit from the new 2.0 classes. The alternative, leaving the 1.1 hierarchy alone, would effectively isolate 1.1 applications from the new features.

The impact of this decision would be noticed by applications that rely on the polymorphism provided by the old hierarchy, by having a list of `BaseWins`, for example. Since the operations defined by `BaseWin` are no longer inherited by `DlgWin` or `ScreenWin` (they are re-implemented in those classes), you can't cast a `ScreenWin` to a `BaseWin` or vice-versa.

However, you can cast both `ScreenWin` and `BaseWin` to a common ancestor, the `XVT_DrawableContainer` class. By changing the list of `BaseWins` to a list of `XVT_DrawableContainers`, you can maintain the polymorphism allowed by the old hierarchy. The dynamic downcast routines provided by `XVT_Base` allow for safe downcasting so that the original `BaseWin` code can be used.

Class Hierarchy

Figure 1 shows a diagram of the XVT++ class hierarchy.

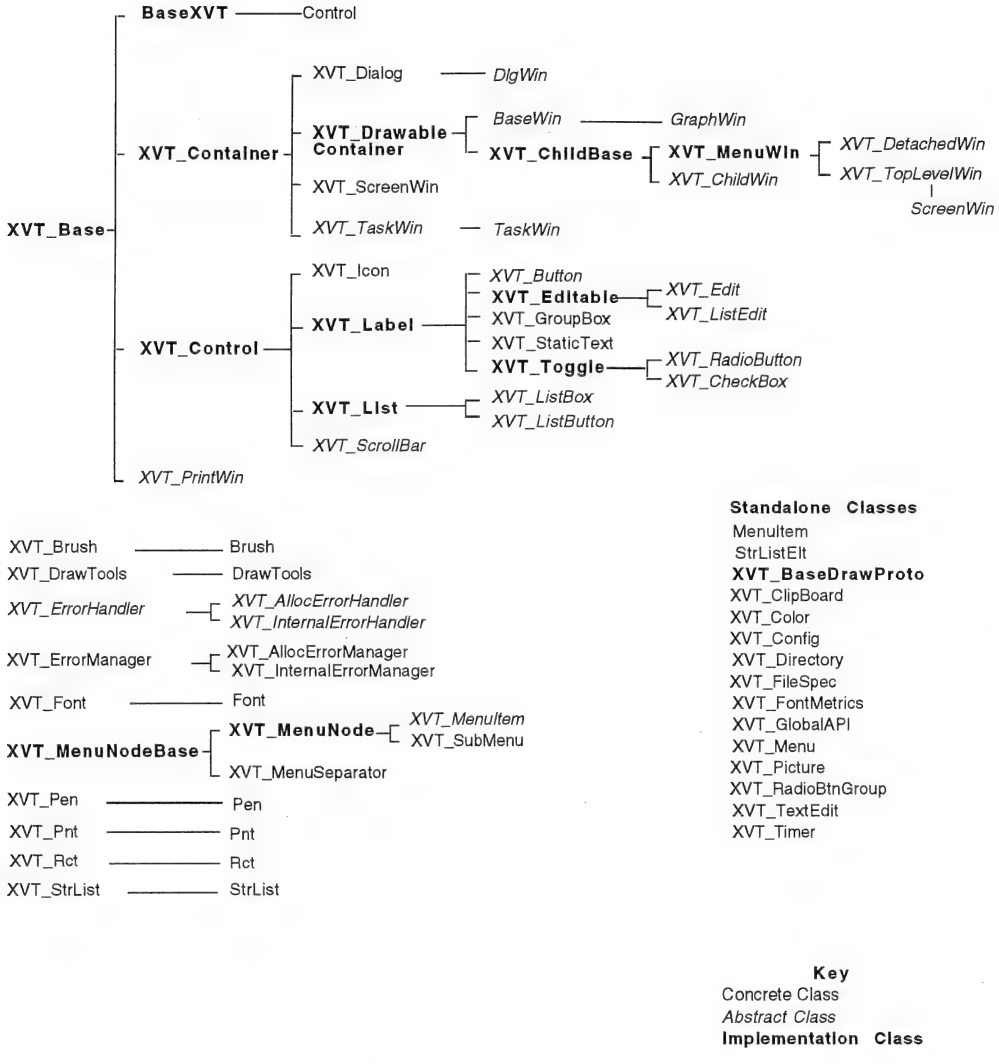


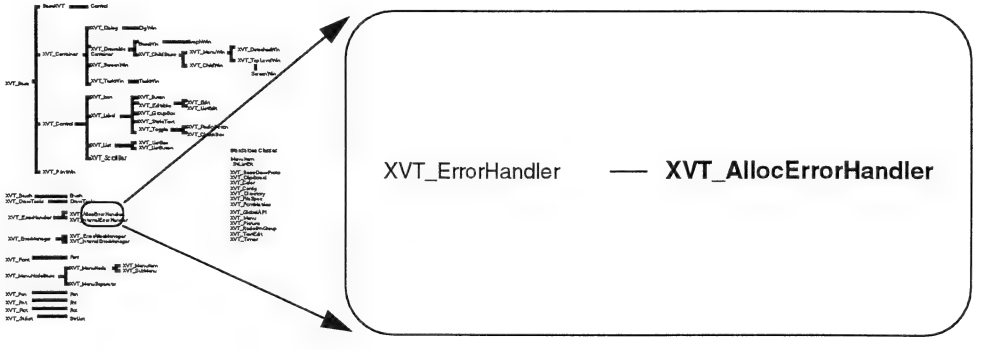
Figure 1: The XVT++ Class Hierarchy.

2

XVT++ CLASSES

This chapter describes the XVT++ classes, except for the 1.1 compatibility classes, which are described in Chapter 3.

XVT_AllocErrorHandler



Overview

Header File	`error.h`
Source File	`error.cc`
Superclass	`XVT_ErrorHandler`
Subclasses	
Usage	Abstract

This class defines the interface to all memory allocation error handlers. To create your own memory allocation error handler, you would create a subclass that provides an implementation of `Handler`, which takes whatever recovery actions you want.

Constructors

`XVT_AllocErrorHandler()`

Member Functions

XVT_AllocErrorHandler::Handler

HANDLE A MEMORY ALLOCATION ERROR

Prototypes

```
protected:

virtual BOOLEAN
Handler() = 0
```

Return Value

`TRUE` if the handler resolved the error condition and program execution can continue, `FALSE` if the next handler in the chain should be tried.

Description

This function is called by `Handle` when this error handler is given a chance to handle a memory allocation error. Your subclass must provide an implementation that takes whatever recovery actions are necessary.

A typical strategy for handling memory allocation errors is to allocate a substantial amount of memory (say 20K) at program start up and then to free it from within an allocation error handler. If the intent of your implementation is to actually handle the memory allocation error, then you should free up as much memory as you can and return `TRUE`.

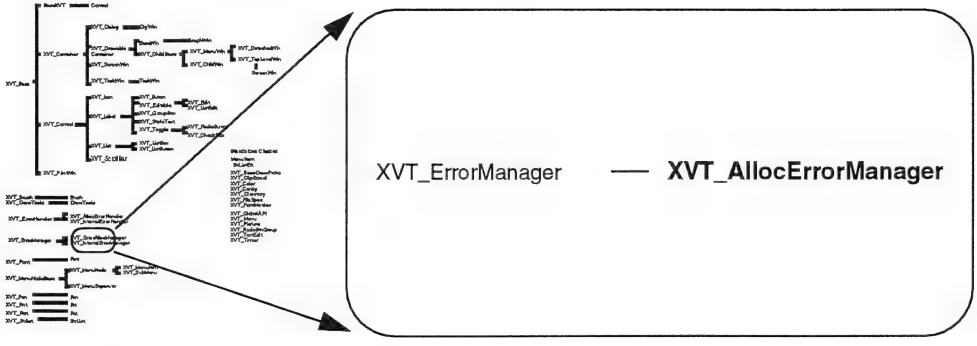
XVT++ uses both `malloc` and `new`. It is not required that `new` and `malloc` use the same heap. Unless they do in fact use the same heap in your target environments, you will have to both `free` and `delete` memory in order to recover reliably.

Inherited Member Functions

From XVT_ErrorHandler

page 167 `virtual BOOLEAN Handle( long data )`

XVT_AllocErrorManager



Overview

Header File	`error.h`
Source File	`error.c`
Superclass	`XVT_ErrorManager`
Subclasses	
Usage	Concrete

Instances of this class handle memory allocation errors. These errors arise either when new fails or when the underlying XVT toolkit is not able to allocate more memory.

There is only one instance of this class, pointed to by the global variable, `XVT_AllocError`.

Constructors

`XVT_AllocErrorManager()`

Member Functions

XVT_AllocErrorManager::Raise

RAISE A MEMORY ALLOCATION ERROR

Prototypes

```
void
Raise()
```

Return Value

If `Raise` returns, a handler has repaired the out-of-memory condition by releasing memory. The operation that ran out of memory should be retried.

Description

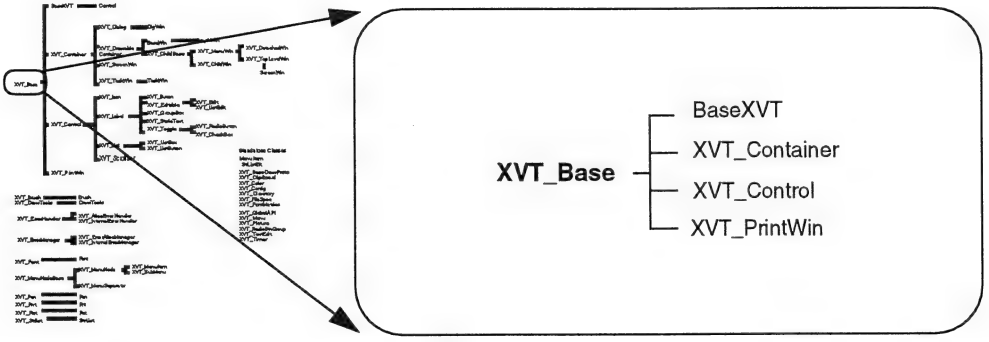
This function is called from two places: the new handler and the error handler registered under `ATTR_MALLOC_ERR_HANDLER`.

Inherited Member Functions

From XVT_ErrorManager

page 170 `virtual void Raise( long data )`

XVT_Base



Overview

Header File	`xvtbase.h`
Source File	`xvtbase.cc`
Superclass	
Subclasses	`BaseXVT, XVT_Container, XVT_Control, XVT_PrintWin`
Usage	Implementation

The `XVT_Base` class defines the interface common to all GUI objects that have visible representations on the screen.

Casts

Virtual cast functions are provided to allow type-safe downcasting. The default implementation of each cast function is to return `NULL`. Each subclass overrides the corresponding cast function to return a pointer to `this` instead.

```
virtual DlgWin* CastToDlgWin()
virtual ScreenWin* CastToScreenWin11()
virtual TaskWin* CastToTaskWin11()
```

```
virtual BaseWin* CastToBaseWin()
virtual XVT_Button* CastToButton()
virtual XVT_CheckBox* CastToCheckBox()
virtual XVT_ChildWin* CastToChildWin()
virtual XVT_DetachedWin* CastToDetachedWin()
virtual XVT_Dialog* CastToDialog()
virtualXVT_DrawableContainer*CastToDrawableContainer()
virtual XVT_Edit* CastToEdit()
virtual XVT_GroupBox* CastToGroupBox()
virtual XVT_Icon* CastToIcon()
virtual XVT_ListBox* CastToListBox()
virtual XVT_ListButton* CastToListButton()
virtual XVT_ListEdit* CastToListEdit()
virtual XVT_MenuWin* CastToMenuWin()
virtual XVT_PrintWin* CastToPrintWin()
virtual XVT_RadioButton* CastToRadioButton()
virtual XVT_ScreenWin* CastToScreenWin()
virtual XVT_ScrollBar* CastToScrollBar()
virtual XVT_StaticText* CastToStaticText()
virtual XVT_TaskWin* CastToTaskWin()
virtual XVT_TopLevelWin* CastToTopLevelWin()
```

Member Variables

XVT_Base::_ScreenWin

THE SCREEN WINDOW

Declaration

```
static XVT_ScreenWin* _ScreenWin;
```

Description

A pointer to the screen window.

XVT_Base::_TaskWin

THE TASK WINDOW

Declaration

```
static XVT_TaskWin* _TaskWin;
```

Description

A pointer to the task window.

Member Functions

XVT_Base::GetInnerRect

RETRIEVE THE BOUNDARY OF THE CLIENT AREA

Prototypes

```
virtual XVT_Rct
GetInnerRect() const
```

Return Value

The coordinates of the client area relative to the parent window. This rectangle is *not* normalized, in other words, the upper-left point is not necessarily `(0,0)`. To normalize a rectangle, use the `XVT_Rct::Normalize` member function.

Description

Retrieves the boundary of the client area.

For windows and dialogs, the client area is the rectangular area inside the border.

For drop-down controls, the client area is considered to be the size of the control when not dropped down.

For all other types of controls, the client area is identical to the outer boundary.

Equivalent C Function

```
get_client_rect()
```

XVT_Base::GetOuterRect

RETRIEVE THE OUTER BOUNDARY OF ANY GUI OBJECT

Prototypes

```
virtual XVT_Rct
GetOuterRect() const
```

Return Value

The coordinates of the outer boundary relative to the parent window.

Description

Gets the current outer boundary of the object.

The outer boundary is the maximum extent of marks made on the screen by the rendering of the object.

For windows and dialogs, the outer boundary includes the border and any border decorations.

For drop-down controls, the outer boundary is the boundary of the control when dropped.

For all other types of controls, the outer boundary is always identical to what was set with `SetInnerRect`.

Equivalent C Function

`get_outer_rect()`

XVT_Base::GetType

RETRIEVE THE WINDOW TYPE OF ANY OBJECT

Prototypes

```
virtual WIN_TYPE
GetType() const
```

Return Value

The object's window type.

Description

Retrieve the window type of this object.

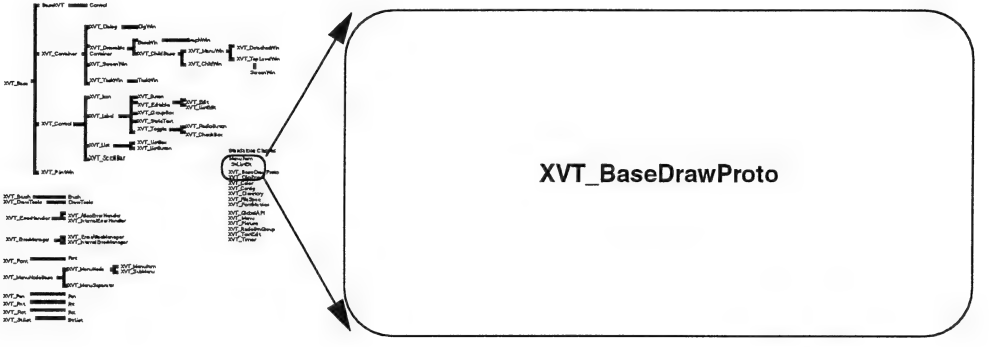
Equivalent C Function

```
get_window_type
```

Implementation Members

```
XVT_Base
~XVT_Base
GetWindowID
WindowID
InitProtocols
```

XVT_BaseDrawProto



Overview

Header File	`draw_p.h`
Source File	`draw_p.cc`
Superclass	
Subclasses	
Usage	Implementation

The `XVT_BaseDrawProto` (Base Drawing Protocol) class provides indirect access to drawing functionality.

Instances of this class are created automatically by objects that can do drawing.

Member Functions

XVT_BaseDrawProto::DrawALine

DRAW A LINE

Prototypes

```
void
DrawALine(
        XVT_Pnt,            point
        BOOLEAN,            start_arrow
        BOOLEAN             end_arrow )
```

Parameters

`point`
The point to draw to.

`start_arrow`
A flag that is `TRUE` if there should be an arrow at the beginning of the line, `FALSE` if not.

`end_arrow`
A flag that is `TRUE` if there should be an arrow at the end of the line, `FALSE` if not.

Description

Draws a line from the current pen position to `point` relative to the window's client area.

The pen position for subsequent drawing functions becomes `point`.

Implementation Notes

XVT/CH
Only horizontal and vertical lines are drawn accurately.

Equivalent C Function

`win_draw_aline()`

XVT_BaseDrawProto::DrawArc

DRAW AN OVAL ARC

Prototypes

```
void
DrawArc(
        XVT_Rct         boundary,
        XVT_Pnt         start
        XVT_Pnt         stop )
```

Parameters

`boundary`
The bounding rectangle for the oval on which the arc is drawn. The bounding rectangle should not be empty.

`start`
Start vector.

`stop`
Stop vector.

Description

This function draws an arc that is a section of the perimeter of an oval bounded by `boundary` in the client area of the window. The arc is drawn counter-clockwise along the oval, from the intersection of the start vector and the oval to the intersection of the stop vector and the oval.

Implementation Notes

XVT/CH
The rectangle given by `boundary` is drawn instead of an arc.

Equivalent C Function

`win_draw_arc()`

XVT_BaseDrawProto::DrawIcon

DRAW AN ICON

Prototypes

```
void
DrawIcon(
        XVT_Pnt                 point
        long                    rid )
```

Parameters

`point`
Coordinate of the icon's upper left corner.

`rid`
Resource ID.

Description

This function draws the icon whose resource ID is `rid` so that its upper left corner is at point `(x, y)` in the window's client area. The current background and foreground colors are used. The current drawing mode, pen, and brush are ignored.

Implementation Notes

XVT/Mac
The icon must have a resource type of ICON or CICN.

XVT/Win
The icon must be declared in an ICON statement in the resource script.

XVT/PM
The icon must be declared in a BITMAP statement in the resource script.

XVT/XM
There must be an ICON definition in your resource manager file.

XVT/CH
This function isn't very useful because it merely displays the `rid` argument.

Equivalent C Function

`win_draw_icon()`

XVT_BaseDrawProto::DrawLine

DRAW A LINE

Prototypes

```
void
DrawLine(
        XVT_Pnt                 pnt )
```

Parameters

`pnt`
The point to draw to.

Description

This function draws a line from the current pen position to `pnt`.

The pen position for subsequent drawing functions becomes `pnt`.

Implementation Notes

XVT/CH
Only horizontal and vertical lines are drawn accurately.

Equivalent C Function

`win_draw_line()`

XVT_BaseDrawProto::DrawOval

DRAW AN OVAL

Prototypes

```
void
DrawOval(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The bounding rectangle for the oval. The bounding rectangle should not be empty.

Description

This function draws an oval (ellipse) that is bounded by the rectangle `boundary`.

Implementation Notes

XVT/CH

The rectangle given by boundary is drawn instead of an arc.

Equivalent C Function

win_draw_oval()

XVT_BaseDrawProto::DrawPicture

DRAW A PICTURE

Prototypes

```
void
DrawPicture(
        XVT_Rct             boundary,
        XVT_Picture*        pict )
```

Parameters

boundary

The rectangle that bounds the drawn picture. The picture is scaled to fit the rectangle. For best results, the aspect ratio of boundary should be the same as the aspect ratio of the frame in which the picture was originally drawn.

pict

A pointer to the picture to draw.

Description

Draws a picture in the window's client area.

Implementation Notes

XVT/Mac

Pictures are Mac PICTs, which scale and stretch nicely.

XVT/Win, XVT/PM, XVT/XOL

Pictures are bitmaps, which tend to look "jaggy" when scaled or stretched. On these systems, drawing the picture in its original size is significantly faster than scaling or stretching it.

XVT/CH

Pictures are character maps. Scaling is ignored and the picture is simply clipped to boundary. To avoid any of these artifacts, you should draw the picture in its original size.

Equivalent C Function

```
win_picture_draw()
```

XVT_BaseDrawProto::DrawPie

DRAW A PIE SECTION

Prototypes

```
void
DrawPie(
        XVT_Rct             boundary,
        XVT_Pnt             start
        XVT_Pnt             stop )
```

Parameters

`boundary`
The bounding rectangle for the oval from which the pie is taken. The bounding rectangle should not be empty.

`start`
Start vector.

`stop`
Stop vector.

Description

This function draws a section of an oval (a pie slice) in the client area of the window. The oval is bounded by `boundary`. An arc is drawn counter-clockwise along the oval, from the intersection of the start vector and the oval to the intersection of the stop vector and the oval. The pie is completed by drawing lines from the start and stop points to the center of the rectangle.

Implementation Notes

XVT/CH
The rectangle given by `boundary` is drawn instead of a pie slice.

Equivalent C Function

```
win_draw_pie()
```

XVT_BaseDrawProto::DrawPolygon

DRAW A POLYGON

Prototypes

```
void
DrawPolygon(
        XVT_Pnt*                pnts,
        long                    num )
```

Parameters

`pnts`
A pointer to an array of points that describe the vertices of a polygon.

`num`
The number of points in `pnts`.

Description

This function draws a polygon described by `num` vertices in the array `pnts` into the window's client area. If the starting and ending points don't coincide, an additional side is drawn to close the shape by connecting the starting and ending points, so there is an enclosed interior. The points are connected in the order found in the array. If any sides intersect, the determination of what's inside and what's outside is undefined.

For best performance, set the first point equal to the last point. Otherwise, XVT++ may have to allocate an array with `num + 1` points in it and copy the original array to it.

Implementation Notes

XVT/CH
The polygon is rendered as though it were a polyline. No interior fill is done.

Equivalent C Function

`win_draw_polygon()`

XVT_BaseDrawProto::DrawPolyline

DRAW A POLYLINE

Prototypes

```
void
DrawPolyline(
        XVT_Pnt*                pnts,
        long                    num )
```

Parameters

`pnts`
A pointer to an array of points that describe the vertices of a polygon.

`num`
The number of points in `pnts`.

Description

This function connects the `num` points in the `pnts` array with straight lines drawn in the window's client area. The last point is not automatically connected to the first; if you want a closed shape, make them the same. However, even if you create a closed shape, the shape is not considered to have an interior. If you want an interior, use `DrawPolygon`.

Implementation Notes

XVT/CH
Only horizontal and vertical lines are drawn accurately. Vertices between horizontal and vertical line segments are rendered with corner characters if available.

Equivalent C Function

`win_draw_polyline()`

XVT_BaseDrawProto::DrawRect

DRAW A RECTANGLE

Prototypes

```
void
DrawRect(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The rectangle to be drawn. The rectangle should not be empty.

Description

Draws a rectangle in the window's client area.

A special usage of `DrawRect` is supported for inverting text to show a selection. To do that, use a hollow pen, a color of black, a solid brush, and a drawing mode of `M_XOR`. Other combinations (e.g., a black pen) may display gaps between selection rectangles that are supposed to touch. The above combination doesn't have this problem.

Equivalent C Function

`win_draw_rect()`

XVT_BaseDrawProto::DrawRoundedRect

DRAW A RECTANGLE WITH ROUNDED CORNERS

Prototypes

```
void
DrawRoundedRect(
        XVT_Rct,                boundary
        long,                   oval_width
        long                    oval_height )
```

Parameters

`boundary`
The rectangle to be drawn. The rectangle should not be empty.

`oval_width`
The width of the oval used for rounding corners.

`oval_height`
The height of the oval used for rounding corners.

Description

This function draws a rectangle with rounded corners in the window's client area. Each corner is a quadrant of an oval that is `oval_width` wide and `oval_height` high.

Implementation Notes

XVT/CH

The rectangle does not have rounded corners.

Equivalent C Function

`win_draw_round_rect()`

XVT_BaseDrawProto::DrawText

DRAW A TEXT STRING

Prototypes

```
void
DrawText(
        XVT_Pnt             pnt,
        const char*         str,
        long                len )
```

Parameters

`pnt`

The point relative to which the text will be drawn. The text's baseline is at the point's y coordinate, and the left side of the first character starts at the point's x coordinate.

`str`

The string to draw.

`len`

The number of characters to draw. If `len` is –1 the string is assumed to be null-terminated and the entire string is drawn.

Description

This function outputs the text string `str` starting at the point `pnt`, in the window's client area. The drawing is performed such that the text's baseline is at the point's y coordinate, and the left side of the first character starts at the point's x coordinate. For a diagram that depicts the positioning of text, see the "Drawing" chapter in the *XVT Guide*.

Text is drawn in the current font. The current pen and brush are ignored. Text is always drawn in the current foreground color.

Normally, only the "ink" making up the characters is transferred during drawing. Therefore, if text is drawn on top of existing graphics, the graphics will show through and around the text. However, if the current tools have been set to be opaque with

`XVT_DrawTools::SetOpaqueText( TRUE )`, the text background is drawn in the current background color and existing graphics will not show through.

No ASCII control characters (e.g., tab, backspace, return) in the string are honored. Text layout implied by these controls must instead be achieved by drawing the text in segments and positioning each segment in the window appropriately. The appearance of strings containing such characters is undefined.

Equivalent C Function

```
win_draw_text()
```

XVT_BaseDrawProto::GetBrush

RETRIEVE THE CURRENT BRUSH

Prototypes

```
XVT_Brush
GetBrush() const
```

Return Value

The window's current brush.

Equivalent C Function

```
win_get_draw_ctools()
```

XVT_BaseDrawProto::GetClip

RETRIEVE THE CURRENT CLIPPING RECTANGLE

Prototypes

```
XVT_Rct
GetClip() const
```

Return Value

The current clipping rectangle.

Equivalent C Function

```
get_clip()
```

XVT_BaseDrawProto::GetClipState

DETERMINE WHETHER CLIPPING IS ON OR OFF

Prototypes

```
BOOLEAN
GetClipState() const
```

Return Value

A flag that is TRUE if clipping is enabled, FALSE if it is disabled.

XVT_BaseDrawProto::GetCurrentPoint

RETRIEVE THE CURRENT PEN POSITION

Prototypes

```
XVT_Pnt
GetCurrentPoint() const
```

Return Value

The current pen position.

XVT_BaseDrawProto::GetDrawMode

RETRIEVE THE CURRENT DRAWING MODE

Prototypes

```
DRAW_MODE
GetDrawMode() const
```

Return Value

The current drawing mode.

Equivalent C Function

```
win_get_draw_ctools()
```

XVT_BaseDrawProto::GetDrawTools

RETRIEVE THE CURRENT DRAWING TOOLS

Prototypes

```
XVT_DrawTools
GetDrawTools() const
```

Return Value

The window's current drawing tools.

Equivalent C Function

```
win_get_draw_ctools()
```

XVT_BaseDrawProto::GetFontMetrics

RETRIEVE A FONT'S LEADING, ASCENT AND DESCENT

Prototypes

```
XVT_FontMetrics
GetFontMetrics() const
```

Return Value

The font metrics of the current font.

Equivalent C Function

```
win_get_font_metrics()
```

XVT_BaseDrawProto::GetPen

RETRIEVE THE CURRENT PEN

Prototypes

```
XVT_Pen
GetPen() const
```

Return Value

The window's current pen.

Equivalent C Function

```
win_get_draw_ctools()
```

XVT_BaseDrawProto::GetTextWidth

DETERMINE THE WIDTH OF A TEXT STRING

Prototypes

```
long
GetTextWidth(
        const char*             str,
        long                    len ) const
```

Parameters

`str`
A text string.

`len`
The number of characters in the string. If `len` is –1 the string is assumed to be null-terminated and the entire string is used.

Return Value

The width of the given string when set in the current font.

Description

This function gets the width in pixels of the text string `str` using the current font. This function is useful for calculating text layout, especially word wrapping.

To get the width of a string made of several different fonts (e.g., when the size or style varies), call `GetTextWidth` for the substrings that share a common font, then add up the widths. Using a `len` argument other than –1 is handy for this because the substrings need not be null-terminated.

Equivalent C Function

```
win_get_text_width()
```

XVT_BaseDrawProto::NeedsUpdate

DETERMINE IF AN AREA OF A WINDOW NEEDS TO BE DRAWN

Prototypes

```
BOOLEAN
NeedsUpdate(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The area to check for corruption.

Return Value

A flag which is `TRUE` if any portion of the area bounded by `boundary` needs to be redrawn, `FALSE` if not.

Description

When called from the context of an `e_update`, this function determines whether or not an area of the window needs to be redrawn. Note that the area delivered to `e_update` is the *extent* of all areas which need to be redrawn. It is not necessarily the case that the entire area needs to be redrawn.

Equivalent C Function

`needs_update()`

XVT_BaseDrawProto::SetBackColor

SET THE CURRENT BACKGROUND COLOR

Prototypes

```
void
SetBackColor(
        XVT_Color               color )
```

Parameters

`color`
The new background color.

Description

Sets the window's background color. The background color is used for the spaces between hatch marks of a patterned brush, for the text background when text is opaque, and for the background of icons.

Do not confuse the background color set by this function with any sort of automatic background painting. Your application must explicitly paint a window in the background color during a call to `e_update`, usually by calling `Clear`.

Equivalent C Function

```
win_set_back_color()
```

XVT_BaseDrawProto::SetBrush

SET THE CURRENT BRUSH

Prototypes

```
void
SetBrush(
        XVT_Brush               brush )
```

Parameters

`brush`
The new brush.

Description

Sets the window's current brush. Brushes are used for filling the interior of drawing primitives.

Equivalent C Function

```
win_set_cbrush()
```

XVT_BaseDrawProto::SetClip

SET A WINDOW'S CLIPPING REGION

Prototypes

```
void
SetClip(
        XVT_Rct                 region )
```

Parameters

region
The new clipping region. The region should not be empty.

Description

Sets a window's clipping region. The clipping region is a rectangular area bounded by the window's client area. If clipping is on, no drawing affects the area outside the clipping rectangle.

Equivalent C Function

set_clip()

XVT_BaseDrawProto::SetClipState

TURN CLIPPING ON OR OFF

Prototypes

```
void
SetClipState(
        BOOLEAN                 state )
```

Parameters

state
A flag that is TRUE if clipping is to be enabled, FALSE if it is to be disabled.

Description

Turns clipping on or off.

XVT_BaseDrawProto::SetCurrentPoint

SET THE CURRENT PEN POSITION

Prototypes

```
void
SetCurrentPoint(
        XVT_Pnt                 pnt )
```

Parameters

pnt
The new pen position.

Description

Sets the current pen position. The pen position provides the starting point for the `DrawLine` and `DrawALine` functions.

Equivalent C Function

`win_move_to()`

XVT_BaseDrawProto::SetDrawMode

SET THE CURRENT DRAWING MODE

Prototypes

```
void
SetDrawMode(
        DRAW_MODE               mode )
```

Parameters

`mode`
The new drawing mode.

Description

Sets the window's current drawing mode.

Drawing modes are defined by the `DRAW_MODE` enumeration, which has at least the following members:

`M_COPY`
The normal drawing mode. The source pixels are copied to the screen, erasing any destination pixels underneath them.

`M_XOR`
The source is XOR'd with the inverse (NOT) of the destination. This mode has the property that drawing the same thing twice is guaranteed to have no effect and that drawing something once will be visible under most combinations of foreground and background colors.

`M_OR`
The source pixels are OR'd with the destination pixels and the result is displayed on the screen.

`M_CLEAR`
If the source pixel is set, it is written to the screen. The destination pixels are ignored.

`M_NOT_COPY`
The inverse of the source pixels is copied to the screen.

M_NOT_XOR
The inverse (NOT) of the source is XOR'd with the inverse (NOT) of the destination.

M_NOT_CLEAR
If the source pixel is not set, its inverse is written to the screen. The destination pixels are ignored.

Implementation Notes

Use of modes other than M_COPY for printing is not portable.

Equivalent C Function

```
win_set_draw_mode()
```

XVT_BaseDrawProto::SetDrawTools

SET THE CURRENT DRAWING TOOLS

Prototypes

```
void
SetDrawTools(
        XVT_DrawTools          tools )
```

Parameters

tools
The new drawing tools.

Description

Sets the window's current drawing tools. The drawing tools control the attributes of all the drawing primitives.

Equivalent C Function

```
win_set_draw_ctools()
```

XVT_BaseDrawProto::SetFont

SET THE FONT USED FOR DRAWING TEXT

Prototypes

```
void
SetFont(
        XVT_Font               font )
```

Parameters

`font`
The font that will become the current font. It should have been received by an `e_font` call or through `GetDrawTools`.

Description

This function sets the font to be used for all subsequent calls to `DrawText`.

Implementation Notes

XVT/CH
The current font is ignored. All drawing is done in whatever font the screen supports.

Equivalent C Function

`win_set_font()`

XVT_BaseDrawProto::SetForeColor

SET THE CURRENT FOREGROUND COLOR

Prototypes

```
void
SetForeColor(
        XVT_Color               color )
```

Parameters

`color`
The new foreground color.

Description

Sets the window's foreground color.

The foreground color is used only for drawing text and icons. Other drawing primitives take their colors from the current pen and brush.

Equivalent C Function

`win_set_fore_color()`

XVT_BaseDrawProto::SetPen

SET THE CURRENT PEN

Prototypes

```
void
SetPen(
        XVT_Pen                         pen )
```

Parameters

pen
The new pen.

Description

Sets the window's current pen. Pens are used for drawing the outlines of drawing primitives.

Equivalent C Function

win_set_cpen()

XVT_BaseDrawProto::UpdateWindow

CAUSE A WINDOW'S APPEARANCE TO BE MADE CURRENT

Prototypes

```
void
UpdateWindow()
```

Description

Forces all pending calls to e_update to be made. If calls are pending they will be made recursively, before UpdateWindow returns.

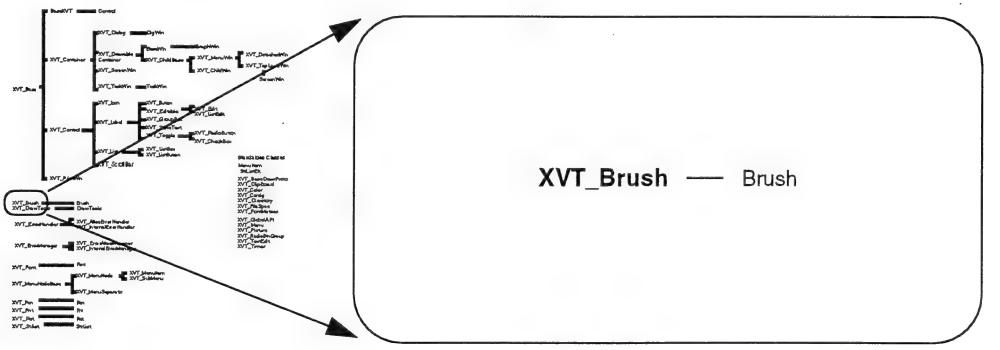
Equivalent C Function

update_window()

Implementation Members

XVT_BaseDrawProto
~XVT_BaseDrawProto
CurrentPoint
ClipState

XVT_Brush



Overview

Header File	`tools.h`
Source File	`tools.cc`
Superclass	
Subclasses	`Brush`
Usage	Concrete

Instances of the brush class describe how interior regions of drawing primitives can be filled.

For brushes with patterns other than `PAT_HOLLOW` or `PAT_SOLID`, the interior area is first filled with the background color from the window's current `XVT_DrawTools` instance; then the hatching is drawn in the brush's color.

Constructors

```
XVT_Brush()
XVT_Brush( PAT_STYLE pattern, XVT_Color color )
```
Create a new brush with the given pattern and color. Equivalent to using the default constructor, then SetPattern and SetColor.

```
XVT_Brush( const XVT_Brush& brush )
~XVT_Brush()
```

Operators

```
XVT_Brush& operator=( const XVT_Brush& brush )
BOOLEAN operator==( const XVT_Brush& brush )
```
Brushes can be assigned and compared for equality.

Member Functions

XVT_Brush::GetColor

RETRIEVE THE BRUSH'S COLOR

Prototypes

```
XVT_Color
GetColor() const
```

Return Value

The brush's current color.

XVT_Brush::GetPattern

RETRIEVE A BRUSH'S PATTERN

Prototypes

```
PAT_STYLE
GetPattern() const
```

Return Value

The brush's pattern.

XVT_Brush::SetColor

SET THE BRUSH'S COLOR

Prototypes

```
void
SetColor(
        XVT_Color               color )
```

Parameters

`color`
The brush's new color.

Description

Sets the brush's color.

XVT_Brush::SetPattern

SET A BRUSH'S PATTERN

Prototypes

```
void
SetPattern(
        PAT_STYLE               pattern )
```

Parameters

`pattern`
The new pattern.

Description

The `PAT_STYLE` enumeration defines the following patterns that are usable in brushes:

`PAT_HOLLOW`
No interior fill.

`PAT_SOLID`
Fill the interior with a solid color.

`PAT_HORZ`
Fill the interior with horizontal lines.

`PAT_VERT`
Fill the interior with vertical lines.

PAT_FDIAG
: Fill the interior with forward-leaning diagonal lines.

PAT_BDIAG
: Fill the interior with backward-leaning diagonal lines.

PAT_CROSS
: Fill the interior with a grid.

PAT_DIAGCROSS
: Fill the interior with a diagonal grid.

Implementation Members

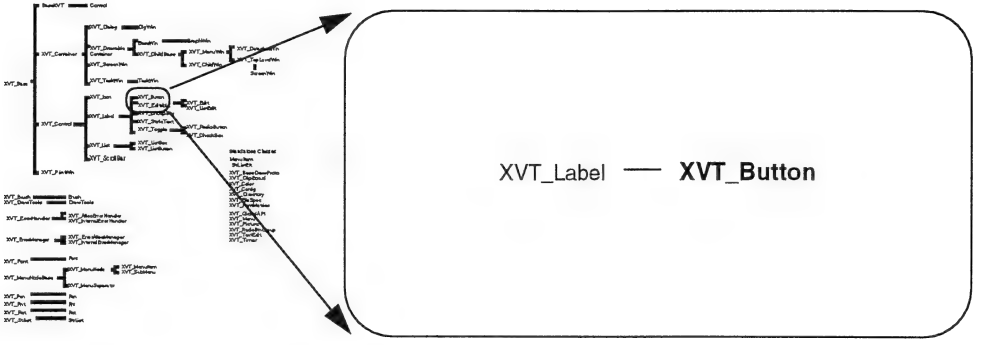
ConvertTo

ConvertFrom

Pattern

Color

XVT_Button



Overview

Header File	`button.h`
Source File	
Superclass	`XVT_Label`
Subclasses	
Usage	Abstract

The `XVT_Button` class defines the interface to all buttons.

You use this class by creating a subclass that overrides virtual event handling member functions with implementations that actually do something in response to events.

Constructors

`XVT_Button( XVT_Dialog* parent, long cid )`
Create a button in a dialog.

`XVT_Button( XVT_DrawableContainer* parent, long cid )`
Create a button in a window.

Member Functions

XVT_Button::e_action

RECEIVE NOTIFICATION THAT BUTTON HAS BEEN OPERATED

Prototypes

```
virtual void
e_action()
```

Description

This member function is called when a button has been operated. The default version does nothing. Your subclass should provide a definition for this function that does whatever you want to do when a button is pressed.

Inherited Member Functions

From XVT_Label

page 239 `void GetTitle( char* str, unsigned long* len )`

page 239 `virtual BOOLEAN Init( XVT_Rct boundary, long = 0L, char * = NULL )`

page 240 `void SetTitle( char* str )`

From XVT_Control

page 92 `virtual void Close()`

page 93 `virtual void e_create()`

page 93 `virtual void e_destroy()`

page 94 `virtual long e_user( long id, void *data )`

page 95 `BOOLEAN GetEnabledState()`

page 95 `long GetID( void )`

page 95 `XVT_Base *GetParent( void )`

page 96 `BOOLEAN GetVisibleState()`

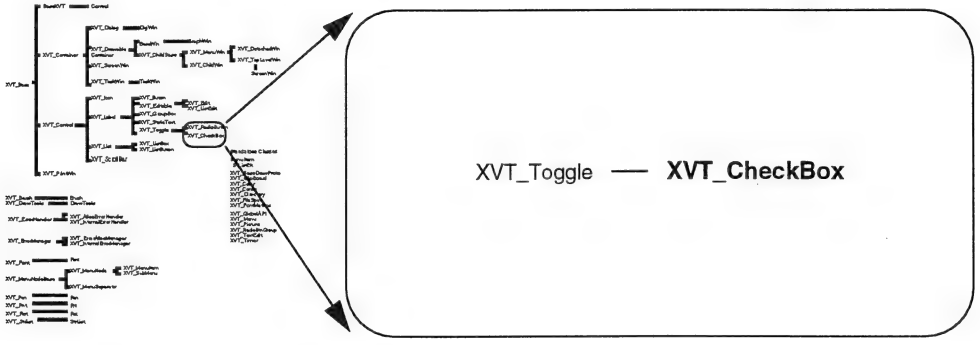
page 96 `void Init()`

page 96 void MakeFront()
page 97 void SetEnabledState(BOOLEAN state)
page 98 void SetInnerRect(XVT_Rct boundary)
page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_CheckBox



Overview

Header File	`checkbox.h`
Source File	`checkbox.cc`
Superclass	`XVT_Toggle`
Subclasses	
Usage	Abstract

The `XVT_CheckBox` class defines the interface to all check boxes.

You use this class by creating a subclass that overrides virtual event handling member functions with implementations that actually do something in response to events.

Constructors

`XVT_CheckBox( XVT_Dialog* parent, long cid )`
Create a check box in a dialog.

`XVT_CheckBox( XVT_DrawableContainer* parent, long cid )`
Create a check box in a window.

`virtual ~XVT_CheckBox()`

Member Functions

XVT_CheckBox::SetCheckedState

CHECK OR UNCHECK A CHECK BOX

Prototypes

```
void
SetCheckedState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag which is `TRUE` if the checkbox is to be checked and `FALSE` if it is to be unchecked.

Description

Check or uncheck a checkbox.

Equivalent C Function

`win_check_box()`

Inherited Member Functions

From XVT_Toggle

page 394 `virtual void e_action()`

page 394 `virtual BOOLEAN GetCheckedState()`

From XVT_Label

page 239 `void GetTitle( char* str, unsigned long* len )`

page 239 `virtual BOOLEAN Init( XVT_Rct boundary, long = 0L, char * = NULL )`

page 240 `void SetTitle( char* str )`

From XVT_Control

page 92 virtual void Close()
page 93 virtual void e_create()
page 93 virtual void e_destroy()
page 94 virtual long e_user(long id, void *data)
page 95 BOOLEAN GetEnabledState()
page 95 long GetID(void)
page 95 XVT_Base *GetParent(void)
page 96 BOOLEAN GetVisibleState()
page 96 void Init()
page 96 void MakeFront()
page 97 void SetEnabledState(BOOLEAN state)
page 98 void SetInnerRect(XVT_Rct boundary)
page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()

page 11 `virtual XVT_ListButton *CastToListButton()`

page 11 `virtual XVT_ListEdit *CastToListEdit()`

page 11 `virtual XVT_MenuWin *CastToMenuWin()`

page 11 `virtual XVT_PrintWin *CastToPrintWin()`

page 11 `virtual XVT_RadioButton *CastToRadioButton()`

page 11 `virtual XVT_ScreenWin *CastToScreenWin()`

page 11 `virtual XVT_ScrollBar *CastToScrollBar()`

page 11 `virtual XVT_StaticText *CastToStaticText()`

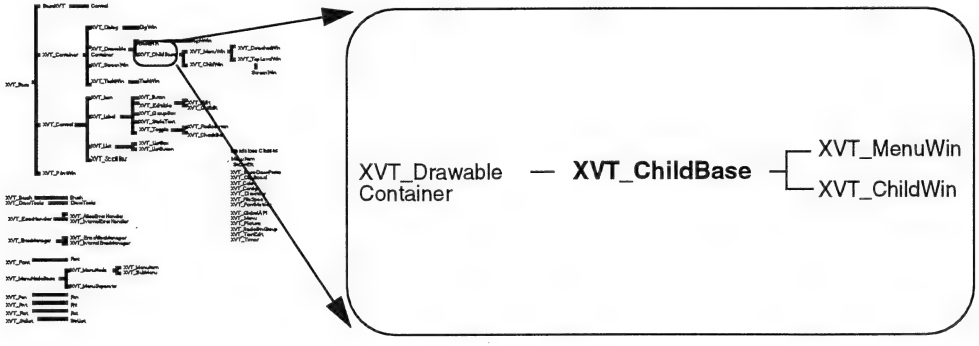
page 11 `virtual XVT_TaskWin *CastToTaskWin()`

page 11 `virtual XVT_TopLevelWin *CastToTopLevelWin()`

page 12 `virtual XVT_Rct GetInnerRect()`

page 13 `virtual XVT_Rct GetOuterRect()`

XVT_ChildBase



Overview

Header File	`childb.h`
Source File	`childb.cc`
Superclass	`XVT_DrawableContainer`
Subclasses	`XVT_ChildWin`, `XVT_MenuWin`
Usage	Implementation

The `ChildBase` class defines the interface common to all windows that may have children.

Member Functions

XVT_ChildBase::e_hscroll

RECEIVE NOTIFICATION OF ACTIVITY ON A WINDOW'S HORIZONTAL SCROLLBAR

Prototypes

```
virtual void
e_hscroll(
        SCROLL_CONTROL          activity,
        long                    pos )
```

Parameters

`activity`
The site of the scrollbar activity.

`pos`
The new thumb position.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to activity on a window's horizontal scrollbar.

This function is identical in behavior to the `XVT_ScollBar::e_action` member function.

XVT_ChildBase::e_vscroll

RECEIVE NOTIFICATION OF ACTIVITY ON A WINDOW'S VERTICAL SCROLLBAR

Prototypes

```
virtual void
e_vscroll(
        SCROLL_CONTROL          activity,
        long                    pos )
```

Parameters

`activity`
The site of the scrollbar activity.

`pos`
The new thumb position.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to activity on a window's vertical scrollbar.

This function is identical in behavior to the `XVT_ScollBar::e_action` member function.

XVT_ChildBase::GetActiveTextEdit

RETRIEVE THE CURRENTLY ACTIVE TEXT EDIT

Prototype

```
XVT_TextEdit*
GetActiveTextEdit()
```

Return Value

A pointer to the currently active text edit object or `NULL` if no text edit object is active.

Description

Retrieve a pointer to the currently active text edit object.

Equivalent C Function

`tx_get_active`

XVT_ChildBase::GetCaretPos

RETRIEVE THE WINDOW'S CURRENT CARET POSITION

Prototypes

```
XVT_Pnt
GetCaretPos() const
```

Return Value

The window's current caret position.

XVT_ChildBase::GetCaretState

DETERMINE IF A WINDOW'S CARET IS VISIBLE OR INVISIBLE

Prototypes

```
BOOLEAN
GetCaretState() const
```

Return Value

A flag that is TRUE if the caret is visible, FALSE if invisible.

XVT_ChildBase::GetEnabledState

DETERMINE WHETHER A WINDOW IS ENABLED OR DISABLED

Prototypes

```
BOOLEAN
GetEnabledState() const
```

Return Value

A flag that is TRUE if the window is enabled, FALSE if not.

XVT_ChildBase::GetParent

RETRIEVE THE PARENT WINDOW

Prototypes

```
virtual XVT_Base*
GetParent() const
```

Return Value

A pointer to the parent window.

Description

Usually, the parent window was given as a parameter when the window was created. The parent of any top-level window or dialog is always the task window. The parent of the task window or any detached window is the screen window.

Equivalent C Function

```
get_parent()
```

XVT_ChildBase::GetScrollPosition

RETRIEVE A BORDER SCROLBAR'S CURRENT POSITION

Prototypes

```
long
GetScrollPosition(
        SCROLL_TYPE             scroll_type ) const
```

Parameters

`scroll_type`
Which border scrollbar to operate on. Valid values are:

`HSCROLL`
Operate on the horizontal border scrollbar.

`VSCROLL`
Operate on the vertical border scrollbar.

Return Value

The border scrollbar's current thumb position.

Equivalent C Function

```
get_scroll_pos()
```

XVT_ChildBase::GetScrollProportion

RETRIEVE A BORDER SCROLLBAR'S THUMB PROPORTION

Prototypes

```
long
GetScrollProportion(
        SCROLL_TYPE             scroll_type ) const
```

Parameters

`scroll_type`
Which border scrollbar to operate on. Valid values are:

`HSCROLL`
Operate on the horizontal border scrollbar.

`VSCROLL`
Operate on the vertical border scrollbar.

Return Value

The border scrollbar's current thumb proportion.

Equivalent C Function

`get_scroll_proportion()`

XVT_ChildBase::GetScrollRange

RETRIEVE A BORDER SCROLLBAR'S RANGE

Prototypes

```
void
GetScrollRange(
        SCROLL_TYPE             scroll_type,
        long*                   min,
        long*                   max ) const
```

Parameters

`scroll_type`
Which border scrollbar to operate on. Valid values are:

`HSCROLL`
Operate on the horizontal border scrollbar.

`VSCROLL`
Operate on the vertical border scrollbar.

`min`
A pointer to storage to receive the minimum value of the scrollbar range.

`max`
A pointer to storage to receive the maximum value of the scrollbar range.

Description

Retrieves a border scrollbar's range.

Equivalent C Function

```
get_scroll_range()
```

XVT_ChildBase::GetTextEdit

RETRIEVE A TEXT EDIT OBJECT BASED ON ID

Prototype

```
XVT_TextEdit*
GetTextEdit(
        long id )
```

Parameters

`id`
The text edit's control ID.

Return Value

A pointer to the corresponding text edit object or `NULL` if no text edit object with a matching ID was found.

Description

This function is used to retrieve text edit objects created from resources. When you create a text edit dynamically, there is no need to use this function because the new operator gives you a pointer to it.

Equivalent C Function

```
get_tx_edit
```

XVT_ChildBase::GetVisibleState

DETERMINE IF A WINDOW IS VISIBLE

Prototypes

```
BOOLEAN
GetVisibleState() const
```

Return Value

A flag that is `TRUE` if the window is visible, `FALSE` if not.

XVT_ChildBase::MakeFront

MAKE A WINDOW BE FRONTMOST AND GIVE IT KEYBOARD FOCUS

Prototypes

```
void
MakeFront()
```

Description

Makes a window be frontmost in the occlusion order and gives it the keyboard focus.

Implementation Notes

XVT/Win
: It is not possible to make a window appear in front of any type of dialog, modal or modeless.

XVT/Mac
: It is not possible to make a window appear in front of a modal dialog.

Equivalent C Function

```
set_front_window()
```

XVT_ChildBase::ReleaseMouse

RELEASE A PREVIOUSLY TRAPPED MOUSE

Prototypes

```
void
ReleaseMouse()
```

Description

Releases a previously trapped mouse.

Equivalent C Function

```
release_mouse()
```

XVT_ChildBase::SetCaretDimensions

SET THE DIMENSIONS OF A WINDOW'S CARET

Prototypes

```
void
SetCaretDimensions(
        XVT_Pnt                 vector )
```

Parameters

`vector`
The caret's dimension vector (height and width). If `vector.X` is zero the default native caret width is used. If `vector.Y` is zero then the caret height changes dynamically according to the height of the current font.

Description

Sets the dimensions of a window's caret.

If you never call this function, the caret assumes a height appropriate for the current font. Therefore, if you only display one font in a window, calling `SetCaretDimensions` is superfluous.

Implementation Notes

XVT/CH
Caret dimensions are ignored.

Equivalent C Function

`set_caret_dimensions()`

XVT_ChildBase::SetCaretPos

SET THE WINDOW'S CARET POSITION

Prototypes

```
void
SetCaretPos(
        XVT_Pnt                 point )
```

Parameters

`point`
The new caret position.

Description

Sets the window's caret position.

Equivalent C Function

```
caret_on()
```

XVT_ChildBase::SetCaretState

MAKE A WINDOW'S CARET VISIBLE OR INVISIBLE

Prototypes

```
void
SetCaretState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the caret is to be visible, `FALSE` if invisible.

Description

Makes a window's caret visible or invisible. The caret is usually used to indicate the text insertion point—where characters typed at the keyboard will appear.

Equivalent C Function

```
caret_off()
caret_on()
```

XVT_ChildBase::SetCursor

SET A WINDOW'S CURSOR SHAPE

Prototypes

```
void
SetCursor(
        CURSOR                  cursor )
```

Parameters

`cursor`
The new cursor.

Valid types of cursors are:

`CURSOR_ARROW`
The standard system arrow.

`CURSOR_IBEAM`
An I-Beam-style cursor typically used for selecting text.

`CURSOR_CROSS`
A cross-hair cursor.

`CURSOR_PLUS`
A plus sign.

`CURSOR_WAIT`
The standard wait cursor.

`CURSOR_USER + N`
A user-defined cursor. `N` starts at zero.

Description

The cursor is the shape that indicates the current mouse position. When the cursor is inside a window's client area or when the mouse is trapped to a window, the cursor is rendered using the window's cursor instead of the standard system pointer.

Implementation Notes

XVT/CH
There is only one cursor, a blinking block. This function is ignored. Your application should not rely on the cursor shape to convey information.

Equivalent C Function

`set_cursor()`

XVT_ChildBase::SetEnabledState

ENABLE OR DISABLE A WINDOW

Prototypes

```
void
SetEnabledState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the window is to be enabled, `FALSE` if it is to be disabled.

Description

Enables or disables a window according to the `state` parameter. When a window is disabled, its `e_focus`, `e_mouse_*` and `e_char` event handler member functions are not called and those events are directed to the window's parent.

Equivalent C Function

`enable_window()`

XVT_ChildBase::SetScrollPosition

SET THE THUMB POSITION OF A BORDER SCROLLBAR

Prototypes

```
void
SetScrollPosition(
        SCROLL_TYPE             scroll_type,
        long                    position )
```

Parameters

`scroll_type`
Which border scrollbar to operate on. Valid values are:

`HSCROLL`
Operate on the horizontal border scrollbar.

`VSCROLL`
Operate on the vertical border scrollbar.

`position`
The border scrollbar's new thumb position. It must be the case that `SHRT_MIN < position < SHRT_MAX`.

Description

Sets the thumb position of a window's border scrollbar.

Equivalent C Function

`set_scroll_pos()`

XVT_ChildBase::SetScrollProportion

SET A BORDER SCROLLBAR'S THUMB PROPORTION

Prototypes

```
void
SetScrollProportion(
        SCROLL_TYPE             scroll_type,
        long                    proportion )
```

Parameters

`scroll_type`
Which border scrollbar to operate on. Valid values are:

`HSCROLL`
Operate on the horizontal border scrollbar.

`VSCROLL`
Operate on the vertical border scrollbar.

`proportion`
The scrollbar's new proportion.

Description

Sets a border scrollbar's thumb proportion.

Equivalent C Function

`set_scroll_proportion()`

XVT_ChildBase::SetScrollRange

SET A BORDER SCROLLBAR'S RANGE

Prototypes

```
void
SetScrollRange(
        SCROLL_TYPE             scroll_type,
        long                    min,
        long                    max,
        long                    pos )
```

Parameters

`scroll_type`
Which border scrollbar to operate on. Valid values are:

`HSCROLL`
Operate on the horizontal border scrollbar.

`VSCROLL`
Operate on the vertical border scrollbar.

`min`
The minimum value of the scrollbar range. It must be the case that `SHRT_MIN < min < SHRT_MAX`.

`max`
The maximum value of the scrollbar range. It must be the case that `SHRT_MIN < max < SHRT_MAX`.

`pos`
The scrollbar thumb position in the new range.

Description

Sets a border scrollbar's range.

Equivalent C Function

`set_scroll_range()`

XVT_ChildBase::SetVisibleState

MAKE A WINDOW VISIBLE OR INVISIBLE

Prototypes

```
void
SetVisibleState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the window is to be visible, `FALSE` if it is to be invisible.

Description

This function makes a window visible or invisible. An invisible window does not appear on the screen and cannot have focus or receive input events. If a window with focus is made invisible, focus is transferred to another window within the application or to the task window if there are no other top level windows. Since the window

cannot receive input events, the event handler member functions `e_char` and `e_mouse_*` are not called.

Equivalent C Function

```
show_window()
```

XVT_ChildBase::TrapMouse

TRAP THE MOUSE

Prototypes

```
void
TrapMouse()
```

Description

Traps the mouse to this window. When the mouse is trapped, *all* mouse events are sent to this window, even if the mouse is outside of the window. This means that the mouse cannot be used to operate anything outside of the window's client area.

Note that the mouse coordinates in mouse events may lie outside the window's client area. Your implementations of the `e_mouse_*` event handlers should take this into account, perhaps by using `XVT_Rct::Constrain` to force mouse coordinates to lie within the client area.

Calls to the trapping window's `e_mouse_move` handler are generated continuously as long as the mouse is trapped.

The effects of trapping the mouse more than once are *undefined*.

Equivalent C Function

```
trap_mouse()
```

Implementation Members

```
XVT_ChildBase
~XVT_ChildBase
Parent
EnableProtocol
ShowProtocol
ScrollProtocol
HasVertScroll
```

```
HasHorzScroll
EnabledState
VisibleState
CaretState
CaretPos
CreateTxList
CreateTextEdits
```

Inherited Member Functions

From XVT_DrawableContainer

page 129
```
void Clear()
```

page 129
```
void Clear( XVT_Color color )
```

page 129
```
void Close()
```

page 128
```
XVT_BaseDrawProto* DrawProtocol
```

page 130
```
virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)
```

page 131
```
virtual void e_create()
```

page 132
```
virtual void e_destroy()
```

page 132
```
virtual void e_focus( BOOLEAN active )
```

page 133
```
virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 134
```
virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135 virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 136 virtual void e_size(XVT_Rct boundary)

page 137 virtual void e_timer(long id)

page 137 virtual void e_update(XVT_Rct boundary)

page 139 virtual long e_user(long id, void *data)

page 140 XVT_Control *GetCtl(long cid)

page 140 long GetCtlCount()

page 141 EVENT_MASK GetEventMask() const

page 141 XVT_Control *GetFirstCtl()

page 142 XVT_ChildBase *GetFirstWin()

page 142 XVT_Control *GetNextCtl()

page 143 XVT_ChildBase *GetNextWin()

page 143 long GetWinCount()

page 144 void Invalidate()

page 144 void Invalidate(XVT_Rctregion)

page 145 void Scroll(
XVT_Rct boundary,
long dh,
long dv)

page 146 void SetEventMask(EVENT_MASK ask)

page 148 void SetInnerRect(XVT_Rct r)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

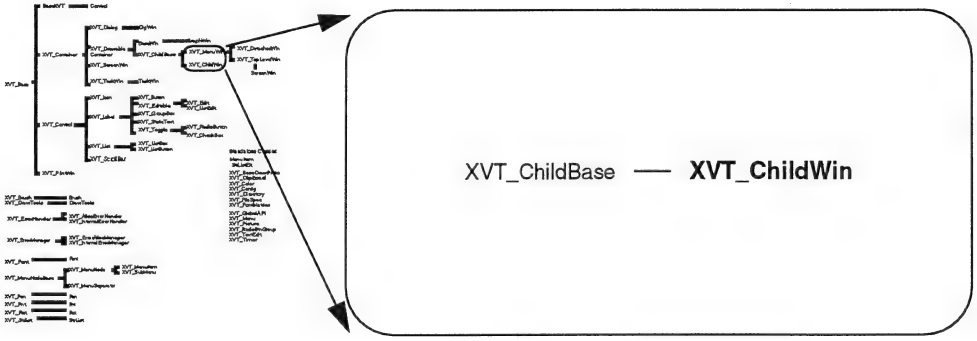
page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_ChildWin



Overview

Header File	`child.h`
Source File	`child.cc`
Superclass	`XVT_ChildBase`
Subclasses	
Usage	Abstract

The `XVT_ChildWin` class defines the interface to all child windows.

This class is an abstract GUI object class. You can instantiate it but the instances will not respond to events.

You use this class by creating a subclass that overrides virtual event handling member functions with implementations that actually do something in response to events.

Constructors

`XVT_ChildWin( XVT_ChildBase* parent )`
Create a child window in the given parent.

`~XVT_ChildWin()`

Member Functions

XVT_ChildWin::Init

INITIALIZE A CHILD WINDOW

Prototypes

```
BOOLEAN
Init(
        WIN_TYPE            wtype,
        XVT_Rct             boundary,
        long                flags )

BOOLEAN
Init(
        long                rid )
```

Parameters

`wtype`
The type of window to be created. It should be either `W_PLAIN` or `W_NO_BORDER`.

`boundary`
The bounding rectangle (in pixels) of the window's client area. The rectangle is relative to the parent window's client area.

`flags`
A bitwise OR'd combination of flags that control the window's attributes and decoration.

`rid`
The resource ID by means of which the window's dimensions, attributes, and contents can be located.

Return Value

`TRUE` if the window was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by windows. Recovery may be attempted by disposing of the new window, closing another window, and retrying the creation of the window.

Description

The `Init` member functions create the native window and call the window's `e_create` method. When execution returns from the `Init` call, the window is complete and ready to use. Prior to the `Init` call the window is not usable.

`Init( wtype, boundary, flags )`
Creates only a window with the given parameters. XVT++ control objects must be created separately by the user.

`Init( rid )`
Creates a window and contained controls from a resource specification. XVT++ control objects corresponding to the controls described in the resource must be created and installed separately by the application developer. The recommended place to do this is in the window's `e_create` member function; however, the control objects can be created at any time. Events intended for controls that have no corresponding XVT++ control object will cause a run-time error.

Equivalent C Function

`create_window()`

`create_def_window()`

`create_res_window()`

Implementation Members

`BOOLEAN Init( XVT_WindowDef* def )`

`GetMenuWinAncestor`

Inherited Member Functions

From XVT_ChildBase

page 49 `virtual void e_hscroll( SCROLL_CONTROL activity, short pos )`

page 49 `virtual void e_vscroll( SCROLL_CONTROL activity, short pos )`

page 50 `XVT_TextEdit* GetActiveTextEdit()`

page 50 `XVT_Pnt GetCaretPos() const`

page 51 `BOOLEAN GetCaretState() const`

page 51 `BOOLEAN GetEnabledState()`

page 51 `XVT_ChildBase *GetParent() const`

page 52 `long GetScrollPosition( SCROLL_TYPE scroll_type ) const`

page 52 `long GetScrollProportion( SCROLL_TYPE scroll_type ) const`

page 53 void GetScrollRange(SCROLL_TYPE scroll_type, long *min, long *max) const

page 54 XVT_TextEdit* GetTextEdit(long id)

page 54 BOOLEAN GetVisibleState()

page 55 void MakeFront()

page 55 void ReleaseMouse()

page 56 void SetCaretDimensions(XVT_Pnt vector)

page 56 void SetCaretPos(XVT_Pnt point)

page 57 void SetCaretState(BOOLEAN state)

page 57 void SetCursor(CURSOR cursor)

page 58 void SetEnabledState(BOOLEAN state)

page 59 void SetScrollPosition(SCROLL_TYPE scroll_type, long position)

page 60 void SetScrollProportion(SCROLL_TYPE scroll_type, long proportion)

page 60 void SetScrollRange(SCROLL_TYPE scroll_type, long min, long max, long pos)

page 61 void SetVisibleState(BOOLEAN f)

page 62 void TrapMouse()

From XVT_DrawableContainer

page 129 void Clear()

page 129 void Clear(XVT_Color color)

page 129 void Close()

page 128 XVT_BaseDrawProto* DrawProtocol

page 130 virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)

page 131 virtual void e_create()

page 132 virtual void e_destroy()

page 132 virtual void e_focus(BOOLEAN active)

page 133
```
virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 134
```
virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 136 `virtual void e_size( XVT_Rct boundary )`

page 137 `virtual void e_timer( long id )`

page 137 `virtual void e_update( XVT_Rct boundary )`

page 139 `virtual long e_user( long id, void *data )`

page 140 `XVT_Control *GetCtl( long cid )`

page 140 `long GetCtlCount()`

page 141 `EVENT_MASK GetEventMask() const`

page 141 `XVT_Control *GetFirstCtl()`

page 142 `XVT_ChildBase *GetFirstWin()`

page 142 `XVT_Control *GetNextCtl()`

page 143 `XVT_ChildBase *GetNextWin()`

page 143 `long GetWinCount()`

page 144 `void Invalidate()`

page 144 `void Invalidate( XVT_Rctregion )`

page 145
```
void Scroll(
XVT_Rct boundary,
long dh,
long dv )
```

page 146 void SetEventMask(EVENT_MASK ask)

page 148 void SetInnerRect(XVT_Rct r)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

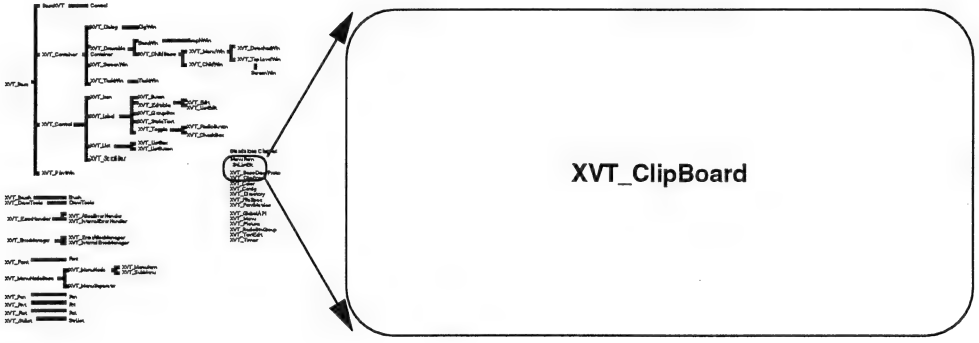
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

XVT_ClipBoard



Overview

Header File	`clipbd.h`
Source File	`clipbd.cc`
Superclass	
Subclasses	
Usage	Concrete

An instance of the clipboard object structures access to the clipboard.

You may dynamically create an instance of this class whenever you need access to the clipboard. There is actually only one instance of the clipboard; it is created by the task window when it initializes and is available as the global variable `XVT_CB`. If you attempt to create more than one instance, `operator new` returns a pointer to the first instance created.

Since instances of the `XVT_ClipBoard` do have state, an attempt to statically allocate an instance causes an error. Always use `new` to create an instance of `XVT_ClipBoard`.

Example

Here is how you might put text data on the clipboard:

```
{
    char* myString = "This is some data for the
clipboard";
    XVT_ClipBoard* theClipBoard;

    theClipBoard = new XVT_ClipBoard;
    theClipBoard->PutData(
           myString,
           sizeof( myString ) );
    delete theClipBoard;
}
```

And here is how you could retrieve it:

```
{
    char* myString;
    long myStringLen;
    XVT_ClipBoard* theClipBoard;

    theClipBoard = new XVT_ClipBoard;
    if (theClipBoard->FormatAvail( CB_TEXT, (char*)0 ))
    {
        myString = theClipBoard->GetData( &myStringLen );
        if (myString)
        {
            // do things with the string data
            .
            .
            .

            delete myString;
        }
    }
    delete theClipBoard;
}
```

Constructors

```
XVT_ClipBoard()
~XVT_ClipBoard()
```

Operators

```
void* operator new( size_t amount )
void operator delete( void* cb )
```

Member Functions

XVT_ClipBoard::Close

CLOSE THE CLIPBOARD

Prototypes

```
BOOLEAN
Close()
```

Return Value

TRUE if the clipboard was successfully closed, FALSE if not.

Description

Close the clipboard. You should make this call as soon after reading or writing data to the clipboard as possible. Since other applications may be prevented from accessing the clipboard when it is open, you should close it as soon as possible after opening it. In particular, you should not return to the main loop between a call to Open and a call to Close.

XVT_ClipBoard::FormatAvail

DETERMINE IF A CLIPBOARD FORMAT IS AVAILABLE

Prototypes

```
BOOLEAN
FormatAvail(
        CB_FORMAT               format,
        const char*             name )
```

Parameters

format
: The desired clipboard format.

name
: A null-terminated character string of 4 characters or less that serves as the clipboard format name for application-defined (CB_APPL) clipboard data types.

Return Value

TRUE if the requested format is available, FALSE if not.

Description

Tests to see if data in a particular format is on the clipboard.

Valid formats are:

CB_TEXT
: This format consists of a sequence of ASCII characters, possibly broken into lines that are terminated with an end-of-line sequence whose value is in the constant EOL_SEQ. In all cases, the sequence is either a plain carriage return (\r), a plain line feed (\n), or a carriage return followed by a line feed (\r\n). The entire sequence is not terminated with a NULL byte. The only way to determine its end is to refer to the size parameter, which always accompanies the data itself.

  When breaking CB_TEXT data into lines (such as after calling GetData), it's easiest to use the function FindEOL. There's no need to use EOL_SEQ directly. However, when building CB_TEXT data, you must concatenate the contents of EOL_SEQ onto each line (with strcat or gstrcat, for example). The last line is not required to end with an end-of-line sequence.

CB_PICT
: This format consists of a linear sequence of bytes that represent an encapsulated picture. The internals of this format are undefined, but you may assume that the bytes can safely be passed from one address space to another (unlike a non-linearized XVT_Picture).

  If you already have an object of type XVT_Picture, you can put it onto the clipboard directly with PutData. You do not need to linearize it first. If you get a linearized picture off the clipboard with GetData, you can turn it into an XVT_Picture object with the data version of the XVT_Picture constructor.

CB_APPL
: This format lets you put your own data structures onto the clipboard, presumably for use by other applications that know about those data structures. Each format has a name, which consists of from 1 to 4 alphabetic and numeric characters. When referring to a CB_APPL format, you must also specify the name. You can put as many CB_APPL formats onto the clipboard as you want (along with CB_TEXT and CB_PICT formats, if you like), as long as they have different names.

The only requirement placed on your CB_APPL data structures is that they must be address-space independent, since they may be passed from one application to another. This means that they must not contain pointers, because those pointers will be invalid to the receiving application. Another way to think about whether a data structure is valid is to ask yourself whether, if it were written to a file, it could be read back in and properly interpreted at a later time by another instance of your formats.

The clipboard need not be opened with Open to call FormatAvail.

Equivalent C Function

cb_format_avail()

XVT_ClipBoard::GetData

RETRIEVE CLIPBOARD DATA

Prototypes

```
char*
GetData(
        CB_FORMAT           format
        const char*         name
        long*               size ) const
```

Parameters

format
The desired clipboard format.

name
A null-terminated character string of 4 characters or less that serves as the clipboard format name for application-defined (CB_APPL) clipboard data types.

size
The size of the data pointed to by the returned pointer.

Return Value

The clipboard data or NULL if the requested format was not available. The returned pointer points to memory allocated by the clipboard. You will have to dispose of it using dispose. For the CB_PICT format, the returned data is a picture object that you will have to dispose of.

Description

`GetData( name, size )`
Retrieves clipboard data in the `CB_APPL` format.

`GetData( size )`
Retrieves clipboard data in the `CB_TEXT` format.

`GetData( boundary )`
Retrieves clipboard data in the `CB_PICT` format.

Equivalent C Function

`cb_open()`

`cb_close()`

`cb_malloc()`

`cb_free()`

`cb_get()`

XVT_ClipBoard::GetOpenState

DETERMINE IF THE CLIPBOARD IS CURRENTLY OPEN

Prototypes

```
BOOLEAN
GetOpenState() const
```

Return Value

`TRUE` if the clipboard is currently open, `FALSE` if not.

XVT_ClipBoard::Open

OPEN THE CLIPBOARD

Prototypes

```
BOOLEAN
Open(
        BOOLEAN                 writing )
```

Parameters

`writing`
A flag which is `TRUE` if the clipboard is to be opened for writing, `FALSE` if for reading.

Return Value

TRUE if the clipboard was successfully opened, FALSE if not.

Description

Prepare the clipboard for reading or writing data. You should make this call immediately before reading or writing data to the clipboard.

XVT_ClipBoard::PutData

PUT DATA ON THE CLIPBOARD

Prototypes

```
BOOLEAN
PutData(
        void*                   data,
        const char*             text,
        long                    size )

BOOLEAN
PutData(
        const char*             text,
        long                    size )

BOOLEAN
PutData(
        XVT_Picture*            pict )
```

Parameters

`name`
A null-terminated character string of 4 characters or less that serves as the clipboard format name for application-defined (CB_APPL) clipboard data types.

`data`
pointer to the data to be placed on the clipboard.

`size`
The size in bytes of the data at which `data` points.

`pict`
The picture to be placed on the clipboard.

Return Value

TRUE if the operation was successful, FALSE if not.

Description

`void PutData( name, data, size )`
Puts `CB_APPL` data on the clipboard.

`void PutData( data, size )`
Puts `CB_TEXT` data on the clipboard.

`void PutData( pict )`
Puts picture data on the clipboard.

Equivalent C Function

`cb_open()`

`cb_close()`

`cb_malloc()`

`cb_free()`

`cb_put()`

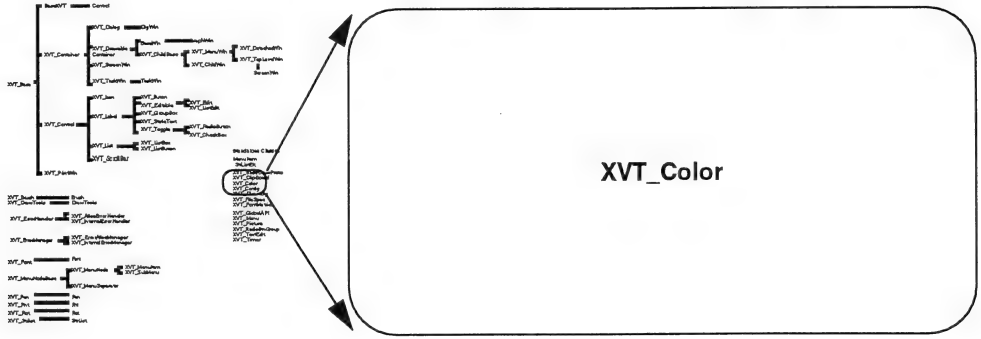
Implementation Members

`Mem`

`OpenState`

`Refcount`

XVT_Color



Overview

Header File	`tools.h`
Source File	`tools.cc`
Superclass	
Subclasses	
Usage	Concrete

Instances of `XVT_Color` represent RGB colors.

Constructors

```
XVT_Color(
    unsigned short red = 0,
    unsigned short green = 0,
    unsigned short blue = 0 )
XVT_Color( const XVT_Color& color )
```

The following macros provide pre-defined XVT_Color objects:

```
XVT_COLOR_RED
XVT_COLOR_GREEN
XVT_COLOR_BLUE
XVT_COLOR_CYAN
XVT_COLOR_MAGENTA
```

```
XVT_COLOR_YELLOW
XVT_COLOR_BLACK
XVT_COLOR_DKGRAY
XVT_COLOR_GRAY
XVT_COLOR_LTGRAY
XVT_COLOR_WHITE
```

The RGB values for each correspond to the name of the macro. Thus, the RGB values of `XVT_COLOR_RED` are (0xFF, 0x00, 0x00). These macros can be wherever an object of type `XVT_Color` is required. They are defined in the header **tools.h**.

```
XVT_Color (COLOR C)
~XVT_Color()
```

Operators

```
XVT_Color& operator=( const XVT_Color& color )
BOOLEAN operator==( const XVT_Color& color )
```

Colors can be assigned and compared.

Member Functions

XVT_Color::GetBlue

RETRIEVE THE BLUE COMPONENT OF A COLOR

Prototypes

```
unsigned short
GetBlue() const
```

Return Value

The blue component, a number from 0 to 255 where 0 is black.

XVT_Color::GetGreen

RETRIEVE THE GREEN COMPONENT OF A COLOR

Prototypes

```
unsigned short
GetGreen() const
```

Return Value

The green component, a number from 0 to 255 where 0 is black.

XVT_Color::GetRed

RETRIEVE THE RED COMPONENT OF A COLOR

Prototypes

```
unsigned short
GetRed() const
```

Return Value

The red component, a number from 0 to 255 where 0 is black.

XVT_Color::SetBlue

SET THE BLUE COMPONENT OF A COLOR

Prototypes

```
void SetBlue(
        unsigned short          b )
```

Parameters

`b`

The blue component, a number from 0 to 255 where 0 is black.

Description

Sets the blue component of a color.

XVT_Color::SetGreen

SET THE GREEN COMPONENT OF A COLOR

Prototypes

```
void
SetGreen(
        unsigned short          g )
```

Parameters

g
The green component, a number from 0 to 255 where 0 is black.

Description

Sets the green component of a color.

XVT_Color::SetRed

SET THE RED COMPONENT OF A COLOR

Prototypes

```
void
SetRed(
        unsigned short          r )
```

Parameters

r
The red component, a number from 0 to 255 where 0 is black.

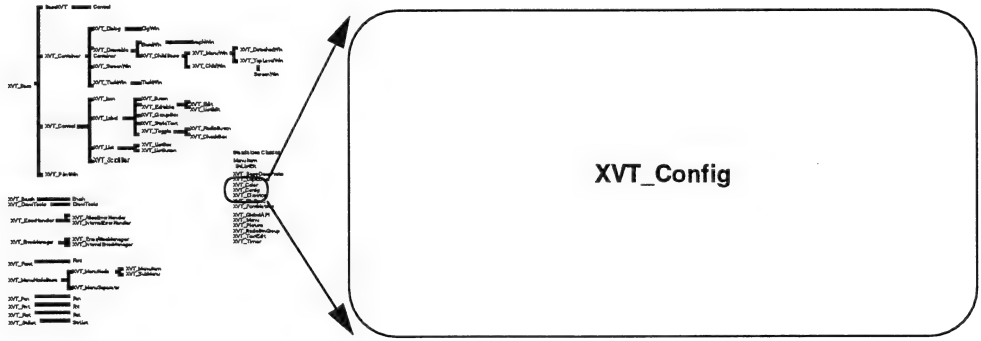
Description

Sets the red component of a color.

Implementation Members

ConvertTo
ConvertFrom
RedValue
GreenValue
BlueValue

XVT_Config



Overview

Header File	config.h
Source File	config.cc
Superclass	
Subclasses	
Usage	Concrete

Instances of this class provide configuration information to an XVT++ application.

Constructors

```
XVT_Config(
    short menubar_id = MENU_BAR_RID,
    short about_id = 0,
    const char* base_appl_name = "untitled",
    const char* appl_name = "untitled",
    const char* task_title = "untitled" )
XVT_Config( const XVT_Config& config )
virtual ~XVT_Config()
```

Member Functions

XVT_Config::GetAboutBoxID

RETRIEVE THE RESOURCE ID FOR THE ABOUT BOX DIALOG

Prototypes

```
short
GetAboutBoxID() const
```

Return Value

The resource ID for the about box dialog.

Equivalent C Function

The XVT_CONFIG structure as declared in the application's main.

XVT_Config::GetApplName

RETRIEVE THE APPLICATION'S NAME

Prototypes

```
BOOLEAN
GetApplName(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

buffer
: Storage to receive the application name.

len
: A pointer to the length of buffer.

Return Value

TRUE if the length of buffer was sufficient to hold the application's name, FALSE if not. If FALSE is returned, len is set to the required length.

XVT_Config::GetBaseApplName

RETRIEVE THE BASENAME OF THE APPLICATION

Prototypes

```
BOOLEAN
GetBaseApplName(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the base application name.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the base name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

Description

Retrieves the base name of the application.

XVT_Config::GetMenuBarID

RETRIEVE THE RESOURCE ID OF THE TASK MENUBAR

Prototypes

```
short
GetMenuBarID() const
```

Return Value

The resource ID of the task menubar.

Equivalent C Function

The `XVT_CONFIG` structure as declared in the application's `main`.

XVT_Config::GetTaskWinTitle

RETRIEVE THE TASK WINDOW'S INITIAL TITLE

Prototypes

```
BOOLEAN
GetTaskWinTitle(
        char*                   buffer
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the task window's title.

`len`
A pointer to the length of `buffer`.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the application's name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

XVT_Config::SetAboutBoxID

SET THE RESOURCE ID FOR THE ABOUT BOX DIALOG

Prototypes

```
void
SetAboutBoxID(
        short                   id )
```

Parameters

`id`
The resource ID for the about box dialog.

Description

Sets the about box dialog resource ID. In order to take effect, this must be set before a task window is instantiated.

XVT_Config::SetApplName

SET THE APPLICATION'S NAME

Prototypes

```
void
SetApplName(
        const char*             appl_name )
```

Parameters

`appl_name`
The application name.

Description

Sets the applications's name. Typically, the application name is prepended to window titles by `SetDocTitle`.

XVT_Config::SetBaseApplName

SET THE APPLICATION'S BASENAME

Prototypes

```
void
SetBaseApplName(
        const char*             base_appl_nam )
```

Parameters

`base_appl_nam`
The base application name used to search for **.hlp**, **.frl**, and **.uid** files.

Description

Sets the application's base name.

XVT_Config::SetMenuBarID

SET THE RESOURCE ID FOR THE TASK MENUBAR

Prototypes

```
void
SetMenuBarID(
        short                   id )
```

Parameters

`id`
The task menubar's resource ID.

Description

Sets the task menubar resource ID. In order to take effect, this must be set before a task window is instantiated.

XVT_Config::SetTaskWinTitle

SET THE TASK WINDOW'S INITIAL TITLE

Prototypes

```
void
SetTaskWinTitle(
        const char*             taskwin_title )
```

Parameters

`taskwin_title`
The task window title.

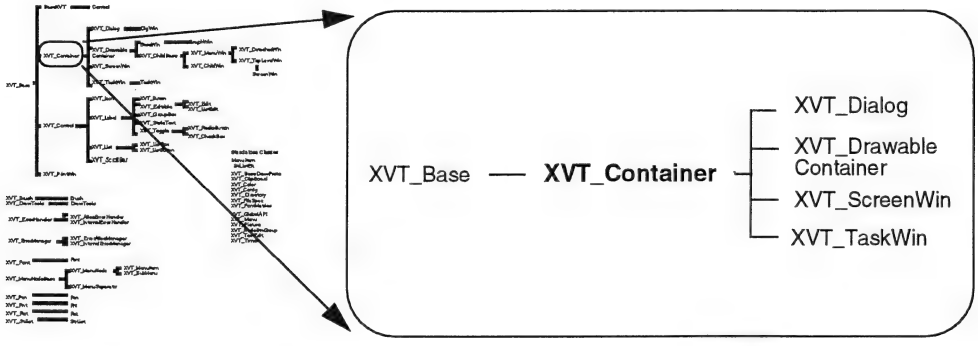
Description

Sets the task window's initial title.

Implementation Members

`ConvertTo`
`ConvertFrom`
`MenuBarID`
`AboutBoxID`
`BaseApplName`
`ApplName`
`TaskWinTitle`

XVT_Container



Overview

Header File	`contain.h`
Source File	`contain.cc`
Superclass	`XVT_Base`
Subclasses	`XVT_Dialog`, `XVT_DrawableContainer`, `XVT_ScreenWin`, `XVT_TaskWin`
Usage	Implementation

The `XVT_Container` class adds no interface. Its purpose is to add the protocols used to manage lists of contained windows or controls.

Implementation Members

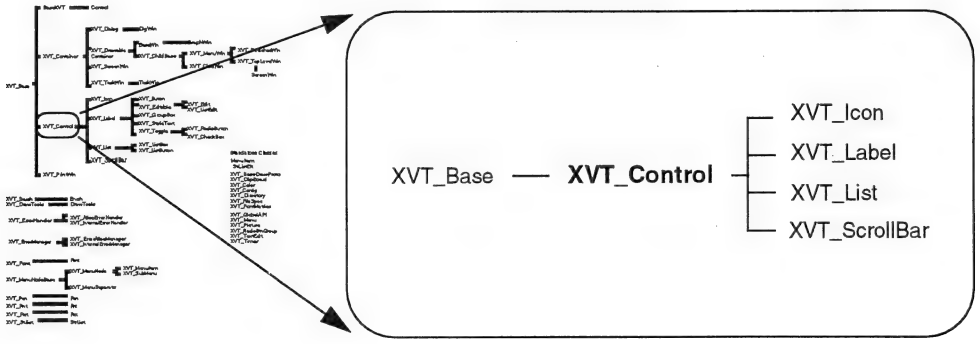
`XVT_Container`
`~XVT_Container`
`GetCtlFlagsList`
`WinContainer`
`CtlContainer`
`CtlFlagsList`

Inherited Member Functions

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_Control



Overview

Header File	`control.h`
Source File	`control.cc`
Superclass	`XVT_Base`
Subclasses	`XVT_Icon, XVT_Label, XVT_List, XVT_ScrollBar`
Usage	Implementation

The `XVT_Control` class defines the interface common to all controls.

Member Functions

XVT_Control::Close

SCHEDULE A CONTROL FOR DESTRUCTION

Prototypes

```
virtual void
Close()
```

Description

Schedules the destruction of this control.

Do not release resources that you have attached to the control until the `e_destroy` event handler member function is called. Until `e_destroy` is called to notify the application of the control's destruction, other events can still arrive even after `Close` has been called.

After the call to the `e_destroy` event handler member function, the control object is deleted automatically. You do not need to delete it.

Equivalent C Function

```
close_window()
```

XVT_Control::e_create

RECEIVE NOTIFICATION OF A CONTROL'S CREATION

Prototypes

```
virtual void
e_create()
```

Description

This member function must be overridden by a control subclass if the application wishes to take any actions in response to a control's creation.

This is the first event handling member function that is called in a control's lifetime. Once this function is called, the control is completely operable and the `e_create` member function of the parent (container) window will already have been called.

XVT_Control::e_destroy

RECEIVE NOTIFICATION OF A CONTROL'S IMPENDING DESTRUCTION

Prototypes

```
virtual void
e_destroy()
```

Description

This member function must be overridden by a control subclass if the application wishes to take any actions in response to a control's destruction.

This is the last event handling member function that is called in a control's lifetime. Once this function is called *none* of the control interface provided by XVT++ can be used. The only purpose of this call is to allow a control to de-allocate resources before it is destroyed.

XVT_Control::e_user

RECEIVE NOTIFICATION OF A USER-DEFINED EVENT

Prototypes

```
virtual long
e_user(
        long                    id,
        void*                   data )
```

Parameters

`id`
The ID of the user-defined event.

`data`
The data associated with the user-defined event.

Description

This member function must be overridden by a control subclass if the application wishes to take any actions in response to user-defined events.

User-defined events are used for two purposes. Events with IDs ranging from 0 to 32767 can be defined by applications for whatever purpose they desire. All other IDs are reserved to XVT and can be used to deliver platform-specific events under some circumstances. See the appropriate XVT platform-specific book.

Note that there is no way to enqueue a user event on the native event queue. To deliver a user event, simply call `e_user` directly.

XVT_Control::GetEnabledState

DETERMINE WHETHER A CONTROL IS ENABLED OR DISABLED

Prototypes

```
BOOLEAN
GetEnabledState() const
```

Return Value

TRUE if the control is enabled, FALSE if not.

XVT_Control::GetID

RETRIEVE THE CONTROL'S ID

Prototypes

```
long
GetID() const
```

Return Value

The control's ID.

Equivalent C Function

```
get_ctl_window()
```

XVT_Control::GetParent

RETRIEVE A CONTROL'S PARENT WINDOW

Prototypes

```
XVT_Base*
GetParent() const
```

Return Value

The control's parent (container) window or dialog.

Equivalent C Function

```
get_parent()
```

XVT_Control::GetVisibleState

DETERMINE IF A CONTROL IS VISIBLE

Prototypes

```
BOOLEAN
GetVisibleState() const
```

Return Value

A flag that is TRUE if the control is visible, FALSE if not.

XVT_Control::Init

INITIALIZE A CONTROL

Prototypes

```
virtual BOOLEAN
Init()
```

Return Value

Always TRUE because the underlying control must already exist.

Description

Creates the native control. This version of `Init` is only for controls that have been created from resources. Instead of actually creating the native control, it just hooks the control object up with the existing native control.

Equivalent C Function

```
create_def_control()
```

```
create_control()
```

XVT_Control::MakeFront

GIVE A CONTROL KEYBOARD FOCUS

Prototypes

```
void
MakeFront()
```

Description

Give a control the keyboard focus and make it the current control with respect to future keyboard navigation requests. If the focus actually changes, the appropriate `e_focus` member functions will be called.

The abstract control classes (`XVT_Button`, `XVT_CheckBox`, and so on) provide an additional version of `Init()` for creating controls at run time.

Equivalent C Function

`set_front_window()`

XVT_Control::SetEnabledState

ENABLE OR DISABLE A CONTROL

Prototypes

```
void
SetEnabledState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the control is to be enabled, `FALSE` if it is to be disabled.

Description

Enables or disables a control according to the `state` parameter. When a control is disabled none of its event handler member functions are called; mouse and character input instead is directed to the control's container.

Equivalent C Function

`enable_window()`

XVT_Control::SetInnerRect

SET A CONTROL'S DIMENSIONS

Prototypes

```
void
SetInnerRect(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The control's new dimensions relative to its parent windows client area.

Description

Sets a control's dimensions. For drop-down controls, the dimensions set are the dimensions of the control when *not* dropped down.

Equivalent C Function

`move_window()`

XVT_Control::SetVisibleState

MAKE A CONTROL VISIBLE OR INVISIBLE

Prototypes

```
void
SetVisibleState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the control is to be made visible, `FALSE` if it is to be made invisible.

Description

Makes a control visible or invisible.

Equivalent C Function

`show_window()`

Implementation Members

XVT_Control
~XVT_Control
Parent
ID
Type
EnableProtocol
ShowProtocol
MoveProtocol
CloseProtocol
EnabledState
VisibleState

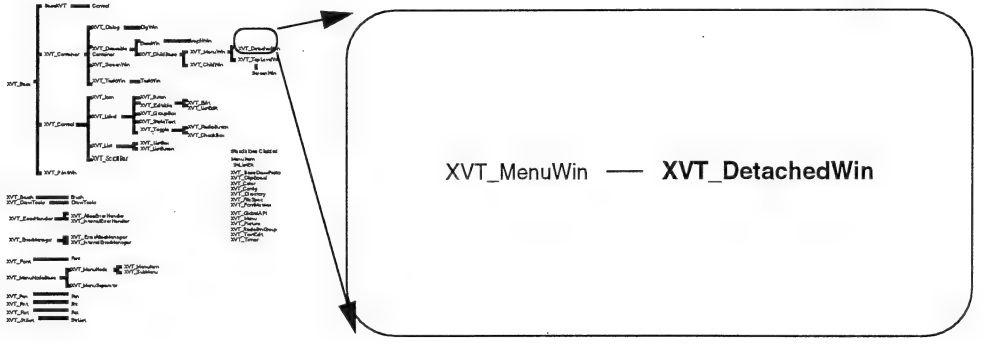
Inherited Member Functions

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_DetachedWin



Overview

Header File	`detached.h`
Source File	`detached.cc`
Superclass	`XVT_MenuWin`
Subclasses	
Usage	Abstract

The `XVT_DetachedWin` class specifies the interface to the class of windows that can contain controls or child windows and that are *not* contained by the task window if the native window system has a task window. This class thus differs from `XVT_TopLevelWin` only under XVT/Win or XVT/PM.

You use this class by creating a subclass that overrides virtual event handling member functions with implementations that actually do something in response to events.

Constructors

`XVT_DetachedWin()`
Create a detached window. The actual method by which the native window is created is determined by which `Init` function is called.

`virtual ~XVT_DetachedWin()`
Removes the detached window from the screen's list of child windows.

Member Functions

XVT_DetachedWin::Init

INITIALIZE THE WINDOW

Prototypes

```
BOOLEAN
Init(
        WIN_TYPE                wtype,
        XVT_Rct                 boundary,
        const char*             title,
        long                    menu_rid,
        long                    flags )

BOOLEAN
Init(
        long                    rid )
```

Parameters

`wtype`
The type of window to be created. It should be one of `W_DOC`, `W_DBL`, or `W_PLAIN`.

`boundary`
The bounding rectangle (in pixels) of the window's client area. The rectangle is in screen coordinates.

`title`
The window's title. If the wtype is `W_DOC`, the title is set as though `SetDocTitle` had been called; otherwise, it is set as though `SetTitle` was called.

`menu_rid`
The resource ID for the window's menu.

`flags`
A bitwise OR'd combination of flags that control the window's attributes and decoration.

`rid`
The resource ID by means of which the window's dimensions, attributes, and contents can be located.

Return Value

`TRUE` if the window was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by windows. Recovery can be attempted by disposing of the new window, closing another window and retrying the creation of the window.

Description

The `Init` member functions create the native window and call the window's `e_create` method. When execution returns from the `Init` call, the window is complete and ready to use. Prior to the `Init` call, the window is not usable.

`Init( wtype, boundary, title, menu_rid, flags )`
Creates only a window with the given parameters. XVT++ control objects must be created separately by the user.

`Init( rid )`
Creates a window and contained controls from a resource specification. XVT++ control objects corresponding to the controls described in the resource must be created and installed separately by the application developer. The recommended place to do this is in the window's `e_create` member function; however, you can create the control objects at any time. Events intended for controls that have no corresponding XVT++ control object cause a run-time error.

Equivalent C Function

`create_window()`

`create_def_window()`

`create_res_window()`

Implementation Members

```
BOOLEAN Init( XVT_WindowDef* def )
```

Inherited Member Functions

From XVT_MenuWin

page 286 virtual void e_close()

page 287 virtual void e_font(XVT_Font font, FONT_PART part)

page 287 XVT_Menu *GetMenu()

page 288 void GetTitle(char *buffer, long len)

page 289 void SetDocTitle(char *str)

page 289 void SetFontMenu(XVT_Font font)

page 290 void SetMenu(XVT_Menu *menu)

page 291 void SetTitle(char *str)

From XVT_ChildBase

page 49 virtual void e_hscroll(SCROLL_CONTROL activity, short pos)

page 49 virtual void e_vscroll(SCROLL_CONTROL activity, short pos)

page 50 XVT_TextEdit* GetActiveTextEdit()

page 50 XVT_Pnt GetCaretPos() const

page 51 BOOLEAN GetCaretState() const

page 51 BOOLEAN GetEnabledState()

page 51 XVT_ChildBase *GetParent() const

page 52 long GetScrollPosition(SCROLL_TYPE scroll_type) const

page 52 long GetScrollProportion(SCROLL_TYPE scroll_type) const

page 53 void GetScrollRange(SCROLL_TYPE scroll_type, long *min, long *max) const

page 54 XVT_TextEdit* GetTextEdit(long id)

page 54 BOOLEAN GetVisibleState()

page 55 void MakeFront()

page 55 void ReleaseMouse()

page 56 void SetCaretDimensions(XVT_Pnt vector)

page 56 `void SetCaretPos( XVT_Pnt point )`

page 57 `void SetCaretState( BOOLEAN state )`

page 57 `void SetCursor( CURSOR cursor )`

page 58 `void SetEnabledState( BOOLEAN state )`

page 59 `void SetScrollPosition( SCROLL_TYPE scroll_type, long position )`

page 60 `void SetScrollProportion( SCROLL_TYPE scroll_type, long proportion )`

page 60 `void SetScrollRange( SCROLL_TYPE scroll_type, long min, long max, long pos )`

page 61 `void SetVisibleState( BOOLEAN f )`

page 62 `void TrapMouse()`

From XVT_DrawableContainer

page 129 `void Clear()`

page 129 `void Clear( XVT_Color color )`

page 129 `void Close()`

page 128 `XVT_BaseDrawProto* DrawProtocol`

page 130
```
virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)
```

page 131 `virtual void e_create()`

page 132 `virtual void e_destroy()`

page 132 `virtual void e_focus( BOOLEAN active )`

page 133
```
virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 134
```
virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 136 `virtual void e_size( XVT_Rct boundary )`

page 137 `virtual void e_timer( long id )`

page 137 `virtual void e_update( XVT_Rct boundary )`

page 139 `virtual long e_user( long id, void *data )`

page 140 `XVT_Control *GetCtl( long cid )`

page 140 `long GetCtlCount()`

page 141 `EVENT_MASK GetEventMask() const`

page 141 `XVT_Control *GetFirstCtl()`

page 142 `XVT_ChildBase *GetFirstWin()`

page 142 `XVT_Control *GetNextCtl()`

page 143 `XVT_ChildBase *GetNextWin()`

page 143 `long GetWinCount()`

page 144 `void Invalidate()`

page 144 `void Invalidate( XVT_Rctregion )`

page 145
```
void Scroll(
XVT_Rct boundary,
long dh,
long dv )
```

page 146 `void SetEventMask( EVENT_MASK ask )`

page 148 `void SetInnerRect( XVT_Rct r )`

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`

page 10 `virtual DlgWin* CastToDlgWin()`

page 10 `virtual ScreenWin* CastToScreenWin11()`

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

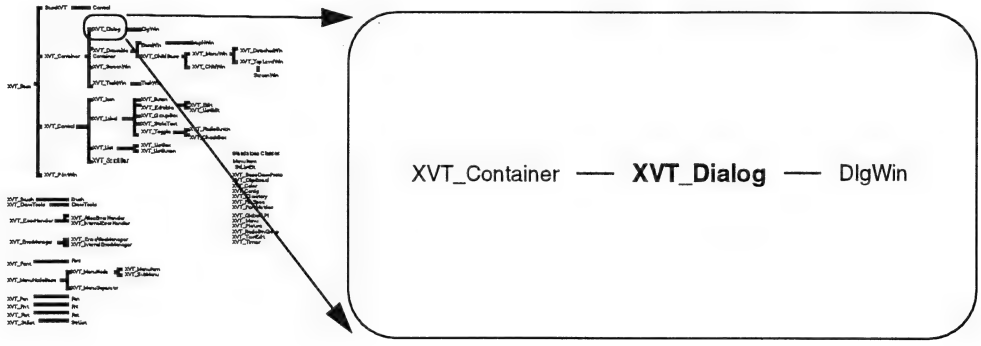
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

XVT_Dialog



Overview

Header File	`dialog.h`
Source File	`dialog.cc`
Superclass	`XVT_Container`
Subclasses	`DlgWin`
Usage	Concrete

The `XVT_Dialog` class defines the interface of all dialogs.

You use this class by creating a subclass that overrides virtual event handling member functions with implementations that actually do something in response to events.

Constructors

```
XVT_Dialog()
virtual ~XVT_Dialog()
```

Member Functions

XVT_Dialog::Close

SCHEDULE A DIALOG'S DESTRUCTION

Prototypes

```
void
Close()
```

Description

Schedules the destruction of this dialog. Typically, this function is called in response to an `e_close` call or whenever the application needs to dispose of a dialog.

The dialog is notified of its impending destruction by a call to its `e_destroy` event handling member function. Do not release resources that you have attached to the dialog until the `e_destroy` event handler member function is called. Until `e_destroy` is called to notify the application of the control's destruction, other events can still arrive even after `Close` has been called.

After the call to the `e_destroy` event handler member function, the dialog object is deleted automatically. You do not need to `delete` it.

Equivalent C Function

```
close_window()
```

XVT_Dialog::e_char

RECEIVE NOTIFICATION OF CHARACTER INPUT

Prototypes

```
virtual void e_char(
        short                   chr,
        BOOLEAN                 shift,
        BOOLEAN                 control )
```

Parameters

`chr`

The input character.

`shift`
A flag that is TRUE if the shift key was depressed, FALSE otherwise.

`control`
A flag that is TRUE if the control key was depressed, FALSE otherwise.

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to a character being typed by the user.

A call to this function is generated when the user types an ASCII character or a function key. If the key is held down and auto-repeat occurs, a separate event is generated for each repetition. Repeated characters don't require special handling.

If the user types an upper-case character or an ASCII control character (such as \t or \b), the true ASCII value will be in `chr`, so it's not necessary to look at `shift` or `control` to see what was actually typed.

XVT provides a set of virtual key codes that represent non-standard characters. Test for a virtual key code, as opposed to a character, by comparing the `chr` argument against the constant `UCHAR_MAX`; values greater than `UCHAR_MAX` represent virtual keys.

You can change the mapping of raw key codes (as generated by the keyboard) to XVT virtual key codes, or add new codes, by changing the default keyboard hook function. This is done with `XVT_GlobalAPI::SetAttrValue` and the attribute `ATTR_KEY_HOOK`. For details, see the platform-specific books.

Implementation Notes

XVT/CH
In non-DOS environments only the shift information is available.

XVT/Win, XVT/PM
Control keys are normally used for accelerators and hence may not get delivered to dialogs.

XVT/Mac
The option key is used to generate non-ASCII characters. The character will be available in `chr` as usual but no indication that the option key was pressed is available.

XVT_Dialog::e_close

RECEIVE NOTIFICATION OF A USER CLOSE REQUEST

Prototypes

```
virtual void
e_close()
```

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to a close request from the user.

A call to `e_close` is generated whenever the user tries to close the dialog by manipulating some sort of "close control" in the dialog border.

When this event is received, the dialog hasn't actually been closed; your application must explicitly call `Close` to accomplish that. Additional event handler member functions (such as `e_focus`) may then be called for the dialog, and your application must be prepared to handle them. The last event handler member function called for a dialog will be `e_destroy`.

If the `e_close` implementation does not call `Close`, then the dialog is not closed, and nothing in the application changes. This distinction is important. Typically, a dialog checks its state when `e_close` is called. If the state indicates that the contents of the dialog have been saved (for example), then the application can simply call `Close`. If, however, the contents have not been saved, the application may display a dialog asking if the user wishes to save or discard changes, so that the changes may be preserved before the call to `Close` is made.

XVT_Dialog::e_create

RECEIVE NOTIFICATION OF DIALOG CREATION

Prototypes

```
virtual
void e_create()
```

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to a dialog's creation.

This is the first event handling member function that is called in a dialog's lifetime. When this function is called, the dialog is completely operable but none of its controls will have been instantiated. Initial operations on controls should thus be performed when the *control's* `e_create` is called.

XVT_Dialog::e_destroy

RECEIVE NOTIFICATION OF A DIALOG'S IMPENDING DESTRUCTION

Prototypes

```
virtual void
e_destroy()
```

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to a dialog's destruction.

This is the last event handling member function that is called in a control's lifetime. Once this function is called *none* of the dialog interface provided by XVT++ can be used. The only purpose of this call is to allow a dialog to de-allocate its resources before it is destroyed.

XVT_Dialog::e_focus

RECEIVE NOTIFICATION OF KEYBOARD FOCUS CHANGE

Prototypes

```
virtual void
e_focus(
        BOOLEAN                 active )
```

Parameters

`active`
A flag that is `TRUE` if the dialog is gaining focus and `FALSE` if it is losing focus.

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to focus changes involving the dialog.

Calls to this member function notify the application that a dialog has either gained or lost the keyboard focus. (These conditions are known as activation and deactivation.) This may have been triggered by the user selecting a window or dialog (thus moving the focus), or by the application via a member function call, such as `MakeFront`. In either case, the application is notified that the focus has been changed.

For a given dialog, a call to `e_focus( TRUE )` is always guaranteed to be paired with either a subsequent call to `e_focus( FALSE )` or, if the window has been closed, a call to `e_destroy` member function. Deactivation events are always followed by activation events, and vice versa, until the window has been closed.

XVT_Dialog::e_size

RECEIVE NOTIFICATION OF A SIZE CHANGE

Prototypes

```
virtual void
e_size(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The dialog's new dimensions.

`height`
The dialog's new height.

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to size changes involving the dialog.

This member function is called under several circumstances:

dialog creation
A call to `e_size` is generated immediately after the call to `e_create`.

user resizes
A call to `e_size` is generated whenever the user resizes a dialog using the border controls.

application resizes
A call to `e_size` is generated whenever the application resizes a dialog using `SetInnerRect`.

Use the new size information in `boundary` to logically rearrange or scale the dialog contents. If your application adjusts controls to fit the new size, it should be done while processing this event.

XVT_Dialog::e_timer

RECEIVE NOTIFICATION OF TIMER EXPIRATION

Prototypes

```
virtual void
e_timer(
        XVT_Timer*              timer )
```

Parameters

`timer`
The timer that expired.

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to timer expirations.

Timers are established by creating an instance of `XVT_Timer` and removed by deleting that instance. It is not necessary to reset the timer. It will generate calls to `e_timer` at the desired interval until it is destroyed.

XVT_Dialog::e_user

RECEIVE NOTIFICATION OF A USER-DEFINED EVENT

Prototypes

```
virtual long
e_user(
        long                    id,
        void*                   data )
```

Parameters

`id`
The ID of the user-defined event.

`data`
The data associated with the user-defined event.

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to user-defined events.

User-defined events are used for two purposes. Events with IDs ranging from 0 to 32767 can be defined by applications for whatever purpose they desire. All other IDs are reserved to XVT and can be used to deliver platform-specific events under some circumstances. See the platform-specific books.

Note that there is no way to enqueue a user event on the native event queue. To deliver a user event, simply call `e_user` directly.

XVT_Dialog::GetCtl

RETRIEVE A CONTROL BY CONTROL ID

Prototypes

```
XVT_Control*
GetCtl(
        long                    cid )
```

Parameters

`cid`
A control ID.

Return Value

The control object associated with the control ID given by `cid`.

XVT_Dialog::GetCtlCount

RETRIEVE THE NUMBER OF CONTROLS IN A DIALOG

Prototypes

```
long
GetCtlCount() const
```

Return Value

The number of controls in a dialog.

XVT_Dialog::GetEnabledState

DETERMINE WHETHER A DIALOG IS ENABLED

Prototypes

```
BOOLEAN
GetEnabledState() const
```

Return Value

`TRUE` if the dialog is enabled, `FALSE` if not.

XVT_Dialog::GetEventMask

RETRIEVE THE CONTAINER'S EVENT MASK

Prototypes

```
EVENT_MASK
GetEventMask() const
```

Return Value

The current event mask.

Equivalent C Function

```
get_event_mask()
```

XVT_Dialog::GetFirstCtl

RETRIEVE THE FIRST CONTROL IN A DIALOG

Prototypes

```
XVT_Control*
GetFirstCtl()
```

Return Value

The first control in the dialog or `NULL` if there were no controls.

Description

Retrieves the first control in the list of controls and sets the control list traversal context such that subsequent calls to `GetNextControl` will retrieve subsequent controls. The entire list of controls in an object definition can be traversed by using the following code:

```
theControl = myDlg->GetFirstControl();
do
{
// ...whatever...
}
while (theControl = myDlg->GetNextControl())
```

XVT_Dialog::GetNextCtl

RETRIEVE SUBSEQUENT CONTROLS IN A DIALOG

Prototypes

```
XVT_Control*
GetNextCtl()
```

Return Value

The next control in the entry list or `NULL` if the end of the control list has been reached.

XVT_Dialog::GetTitle

RETRIEVE A DIALOG'S TITLE

Prototypes

```
BOOLEAN
GetTitle(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the dialog's title.

`len`
A pointer to the length of buffer.

Return Value

TRUE if the length of `buffer` was sufficient to hold the application's name, FALSE if not. If FALSE is returned, `len` is set to the required length.

Equivalent C Function

`get_title()`

XVT_Dialog::GetVisibleState

DETERMINE IF A DIALOG IS VISIBLE

Prototypes

```
BOOLEAN
GetVisibleState() const
```

Return Value

TRUE if the dialog is visible, FALSE if not.

XVT_Dialog::Init

INITIALIZE A DIALOG

Prototypes

```
BOOLEAN
Init(
        long                    rid )
```

Parameters

`rid`
: The resource ID by means of which the dialog's dimensions, attributes, and contents may be located.

Return Value

`TRUE` if the dialog was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by dialogs. Recovery can be attempted by disposing of the new dialog, closing another dialog, and retrying the creation of the dialog.

Description

The `Init` member functions create the native dialog and call the dialog's `e_create` method. When execution returns from the `Init` call, the dialog is complete and ready to use. Prior to the `Init` call, the dialog is not usable.

`Init( rid )`
: Creates a dialog and contained controls from a resource specification. XVT++ control objects corresponding to the controls described in the resource must be created and installed separately by the application developer. The recommended place to do this is in the dialog's `e_create` member function; however, you can create the control objects at any time. Events intended for controls that have no corresponding XVT++ control object will cause a run-time error.

Equivalent C Function

`create_def_dialog()`

`create_res_dialog()`

XVT_Dialog::SetEnabledState

ENABLE OR DISABLE A DIALOG

Prototypes

```
void
SetEnabledState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is TRUE if the dialog is to be enabled, FALSE if it is to be disabled.

Description

Enables or disables a dialog according to the `state` parameter. When a dialog is disabled, its `e_focus` and `e_char` event handler member functions are not called and those events are directed to the dialog's parent.

Equivalent C Function

`enable_window()`

XVT_Dialog::SetEventMask

SET THE CONTAINER'S EVENT MASK

Prototypes

```
void
SetEventMask(
        EVENT_MASK              mask )
```

Parameters

`mask`
The new event mask.

Description

Sets the container's event mask. The event mask is a bitwise OR'd combination of masks, one for each type of event. If the mask bit is set, the corresponding event handler member function is called when that type of event occurs; otherwise, the event is ignored. In some cases applications run more efficiently if undesired events are

masked off rather than just ignored by the application. Valid event masks may be constructed by ORing together the following constants:

EM_NONE
: No event handling member functions are called.

EM_ALL
: All event handling member functions are called.

EM_CREATE
: e_create is called iff (if and only if) set.

EM_DESTROY
: e_destroy is called iff set.

EM_FOCUS
: e_focus is called iff set.

EM_SIZE
: e_size is called iff set.

EM_UPDATE
: e_update is called iff set.

EM_CLOSE
: e_close is called iff set.

EM_CHAR
: e_char is called iff set.

EM_CONTROL
: Control e_action member functions of contained controls is called if set.

EM_TIMER
: e_timer is called iff set.

EM_USER
: e_user is called iff set.

Equivalent C Function

```
set_event_mask()
```

XVT_Dialog::SetInnerRect

SET A DIALOG'S SIZE AND POSITION

Prototypes

```
void
SetInnerRect(
        XVT_Rct                 boundary )
```

Parameters

boundary
The rectangle giving the new coordinates of the dialog's client area relative to the task window, or relative to the screen if the native window system has no task window.

Description

This function moves and/or resizes a dialog such that its client rectangle has the coordinates given in boundary.

Implementation Notes

XVT/XM
The window manager may choose not to honor a move request.

Equivalent C Function

move_window()

XVT_Dialog::SetTitle

SET A DIALOG'S TITLE

Prototypes

```
void
SetTitle(
        const char*             str )
```

Parameters

str
The new title.

Description

Sets a dialog's title.

Equivalent C Function

set_title()

XVT_Dialog::SetVisibleState

MAKE A DIALOG VISIBLE OR INVISIBLE

Prototypes

```
void
SetVisibleState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the dialog is to be visible, `FALSE` if it is to be invisible.

Description

This function makes a dialog visible or invisible. An invisible dialog does not appear on the screen and cannot have focus or receive input events. If a dialog with focus is made invisible, focus is transferred to another window or dialog within the application or to the task window if there are no other top level windows. Since the dialog cannot receive input events, the event handler member functions `e_focus` and `e_char` are not called.

Equivalent C Function

`show_window()`

Implementation Members

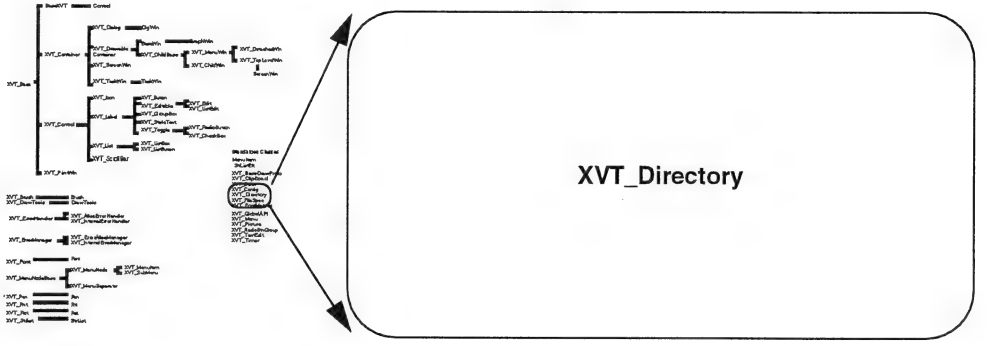
```
BOOLEAN Init( XVT_DialogDef* def )
RemoveCtl
Install
TitleProtocol
ShowProtocol
EnableProtocol
MoveProtocol
CloseProtocol
EnabledState
VisibleState
ControlEvent
```

Inherited Member Functions

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_Directory



Overview

Header File	`filespec.h`
Source File	`filespec.cc`
Superclass	
Subclasses	
Usage	Concrete

Instances of the `XVT_Directory` class represent native directories in a portable, opaque fashion.

Constructors

`XVT_Directory()`
Create an XVT directory object representing the current directory.

`XVT_Directory( DIRECTORY dir )`

`XVT_Directory( const XVT_Directory& dir )`

`XVT_Directory( const char* path )`
Create an XVT directory object representing the directory specified non-portably in str. Equivalent to str_to_dir.

`~XVT_Directory()`

Operators

```
XVT_Directory& operator=( const XVT_Directory& dir )
```

Directories may be assigned.

Member Functions

XVT_Directory::DirToStr

RETRIEVE A NONPORTABLE STRING DIRECTORY SPECIFICATION

Prototypes

```
BOOLEAN
DirToStr(
        char*                   buffer,
        unsigned long*          len )
```

Parameters

`buffer`
Storage to receive the directory name.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the directory name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

Description

Retrieves a nonportable string directory specification suitable for passing to native functions.

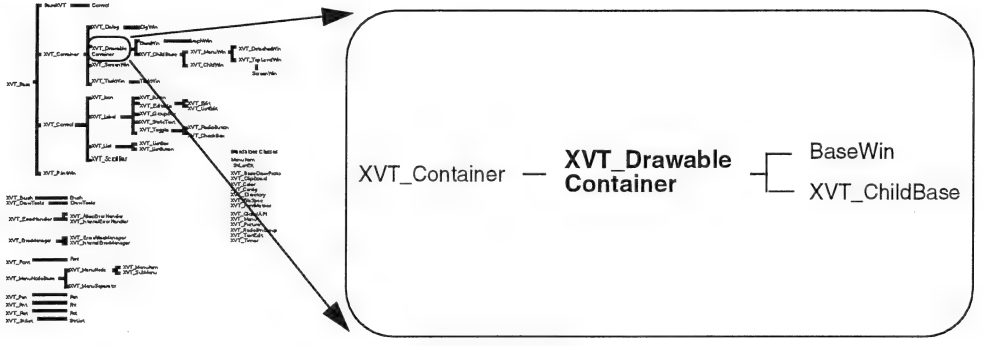
Equivalent C Function

`dir_to_str()`

Implementation Members

```
XVT_Directory( DIRECTORY dir )
ConvertTo
```

XVT_DrawableContainer



Overview

Header File	`drawable.h`
Source File	`drawable.cc`
Superclass	`XVT_Container`
Subclasses	`BaseWin, XVT_ChildBase`
Usage	Implementation

The drawable container class defines the interface common to all windows that can contain child-windows or controls.

Applications make use of this functionality through subclasses; they do not directly subclass or instantiate `XVT_DrawableContainer`.

Member Variables

XVT_DrawableContainer::DrawProtocol

THE WINDOW'S DRAWING PROTOCOL

Prototype

```
XVT_BaseDrawProto*
DrawProtocol
```

Description

The drawing protocol provides access to all of the XVT++ drawing functionality. Access to drawing functionality is indirected in this manner so that the drawing code can be made to work for both windows and print windows. In order to share drawing code, you should create a function, `DoDraw`, which will look something like this:

```
void
DoDraw( XVT_BaseDrawProto* DP, MyContextInfo* Info )
{
    DP->DrawALine( ... );

        .
        .
        . // draw the remainder
}
```

The `Info` parameter provides whatever information you need to draw. You can then call `DoDraw` from both the `e_update` member function of your window and the `DrawAction` member function of your print window.

If printing is not a concern or you do not want to share drawing code, you can easily simplify access to the drawing code by adding inline member functions that duplicate the draw protocol interface to your window subclass. Alternatively, if you are willing to accept the restrictions imposed by multiple inheritance, you could just inherit from the draw protocol.

Member Functions

XVT_DrawableContainer::Clear

CLEAR A WINDOW

Prototypes

```
void
Clear()

void
Clear(
        XVT_Color               color )
```

Parameters

`color`
The background color to use.

Description

`void Clear()`
Clears a window by painting its entire client area in the "standard" background color used by the native system.

`void Clear( color )`
Clears a window by painting its entire client area in the given color.

Equivalent C Function

`clear_window()`

XVT_DrawableContainer::Close

SCHEDULE A WINDOW'S DESTRUCTION

Prototypes

```
void
Close()
```

Description

Schedules the destruction of this window. Typically, this function is called in response to an `e_close` call or whenever the application needs to dispose of a window.

The window is notified of its impending destruction by a call to its e_destroy event handling member function. Do not release resources that you have attached to the window until the e_destroy event handler member function is called. Until e_destroy is called to notify the application of the control's destruction, other events can still arrive even after Close has been called.

After the call to the e_destroy event handler member function, the window object is deleted automatically; you do not need to delete it.

Equivalent C Function

close_window()

XVT_DrawableContainer::e_char

RECEIVE NOTIFICATION OF CHARACTER INPUT

Prototypes

```
virtual void e_char(
        short                   chr,
        BOOLEAN                 shift,
        BOOLEAN                 control )
```

Parameters

chr
: The input character.

shift
: A flag that is TRUE if the shift key was depressed, FALSE otherwise.

control
: A flag that is TRUE if the shift key was depressed, FALSE otherwise.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to a character being typed by the user.

A call to this function is generated when the user types an ASCII character or a function key. If the key is held down and auto-repeat occurs, a separate event is generated for each repetition. Repeated characters don't require special handling.

If the user types an uppercase character or an ASCII control character (such as `\t` or `\b`), the true ASCII value will be in `chr`, so it's not necessary to look at `shift` or `control` to see what was actually typed.

XVT++ provides a set of virtual key codes that represent non-standard characters. Test for a virtual key code, as opposed to a character, by comparing the `chr` argument against the constant `UCHAR_MAX`; values greater than `UCHAR_MAX` represent virtual keys.

You can change the mapping of raw key codes (as generated by the keyboard) to virtual key codes, or add new codes, by changing the default keyboard hook function. This is done with `XVT_GlobalAPI::SetAttrValue` and the attribute `ATTR_KEY_HOOK`. For details, see the platform-specific books.

Implementation Notes

XVT/CH
: In non-DOS environments, only the shift information is available.

XVT/Win, XVT/PM
: Control keys are normally used for accelerators and hence may not get delivered to windows.

XVT/Mac
: The option key is used to generate non-ASCII characters. The character is available in `chr` as usual but no indication that the option key was pressed is available.

XVT_DrawableContainer::e_create

RECEIVE NOTIFICATION OF WINDOW CREATION

Prototypes

```
virtual void
e_create()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to a window's creation.

This is the first event handling member function that is called in a window's lifetime. When this function is called, the window is completely operable but none of its controls or child windows will have been instantiated. Initial operations on controls should thus be performed when the control or child window's `e_create` is called.

XVT_DrawableContainer::e_destroy

RECEIVE NOTIFICATION OF A WINDOW'S IMPENDING DESTRUCTION

Prototypes

```
virtual void
e_destroy()
```

Description

This member function must be overridden by a dialog subclass if the application wishes to take any actions in response to a window's destruction.

This is the last event handling member function that is called in a window's lifetime. Once this function is called, *none* of the window interface provided by XVT++ can be used. The only purpose of this call is to allow windows to de-allocate their resources before they are destroyed.

XVT_DrawableContainer::e_focus

RECEIVE NOTIFICATION OF KEYBOARD FOCUS CHANGE

Prototypes

```
virtual void
e_focus(
        BOOLEAN                 active )
```

Parameters

`active`
A flag that is `TRUE` if the window is gaining focus and `FALSE` if it is losing focus.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to focus changes involving the window.

Calls to this member function notify the application that a window has either gained or lost the keyboard focus. (These conditions are known as activation and deactivation.) This may have been triggered by the user selecting a window or dialog (thus moving the focus), or by the application via a member function call (such as `MakeFront`). In either case, the application is notified that the focus has been changed.

For a given window, a call to `e_focus( TRUE )` is always guaranteed to be paired with either a subsequent call to `e_focus( FALSE )` or, if the window has been closed, a call to `e_destroy`. Deactivation events are always followed by activation events, and vice versa, until the window has been closed.

XVT_DrawableContainer::e_mouse_dbl

RECEIVE NOTIFICATION OF A DOUBLE CLICK

Prototypes

```
virtual void e_mouse_dbl(
        XVT_Pnt             point,
        BOOLEAN             shift,
        BOOLEAN             control,
        short               button )
```

Parameters

`point`
The location of the mouse activity.

`shift`
A flag that is `TRUE` if the shift key was held down during the mouse operation and `FALSE` if not.

`control`
A flag that is `TRUE` if the control key was held down during the mouse operation and `FALSE` if not.

`button`
The mouse button depressed, 0 to 2.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to double clicks.

A mouse double click always shows up as the following sequence of event handler member function calls:

```
e_mouse_down
e_mouse_up
e_mouse_double
e_mouse_up
```

XVT_DrawableContainer::e_mouse_down

RECEIVE NOTIFICATION OF A MOUSE DOWN

Prototypes

```
virtual void
e_mouse_down(
        XVT_Pnt             point,
        BOOLEAN             shift,
        BOOLEAN             control,
        short               button )
```

Parameters

`point`
The location of the mouse activity.

`shift`
A flag that is `TRUE` if the shift key was held down during the mouse operation and `FALSE` if not.

`control`
A flag that is `TRUE` if the control key was held down during the mouse operation and `FALSE` if not.

`button`
The mouse button depressed, 0 to 2.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to mouse clicks.

XVT_DrawableContainer::e_mouse_move

RECEIVE NOTIFICATION OF MOUSE MOVES

Prototypes

```
virtual void
e_mouse_move(
        XVT_Pnt             point,
        BOOLEAN             shift,
        BOOLEAN             control,
        short               button )
```

Parameters

`point`
The location of the mouse activity.

`shift`
A flag that is `TRUE` if the shift key was held down during the mouse operation and `FALSE` if not.

`control`
A flag that is `TRUE` if the control key was held down during the mouse operation and `FALSE` if not.

`button`
The mouse button depressed, 0 to 2.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to mouse movement.

XVT_DrawableContainer::e_mouse_up

RECEIVE NOTIFICATION OF MOUSE UPS

Prototypes

```
virtual void
e_mouse_up(
        XVT_Pnt             point,
        BOOLEAN             shift,
        BOOLEAN             control,
        short               button )
```

Parameters

`point`
The location of the mouse activity.

`shift`
A flag that is `TRUE` if the shift key was held down during the mouse operation and `FALSE` if not.

`control`
A flag that is `TRUE` if the control key was held down during the mouse operation and `FALSE` if not.

`button`
The mouse button depressed, 0 to 2.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to mouse clicks.

XVT_DrawableContainer::e_size

RECEIVE NOTIFICATION OF A SIZE CHANGE

Prototypes

```
virtual void
e_size(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The window's new dimensions.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to size changes involving the dialog.

This member function is called under several circumstances:

window creation
A call to `e_size` is generated immediately after the call to `e_create`.

user resizes
A call to `e_size` is generated whenever the user resizes a window using the border controls.

application resizes
A call to e_size is generated whenever the application resizes a window using SetInnerRect.

Use the new size information in boundary to logically rearrange or scale the window contents. If your application adjusts child windows and controls to fit the new size, it should be done while processing this event.

XVT_DrawableContainer::e_timer

RECEIVE NOTIFICATION OF TIMER EXPIRATION

Prototypes

```
virtual void
e_timer(
        XVT_Timer*              timer )
```

Parameters

timer
The timer that expired.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to timer expirations.

Timers are established by creating an instance of XVT_Timer and removed by deleting that instance. It is not necessary to reset the timer. It will generate calls to e_timer at the desired interval until it is destroyed.

XVT_DrawableContainer::e_update

RECEIVE NOTIFICATION OF WINDOW INVALIDATION

Prototypes

```
virtual void
e_update(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The invalid area. Graphics inside the invalid area should be redrawn.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to window invalidation.

A call to this member function is generated when the client area of a window must be redrawn in whole or in part. In response to this event, you should at least draw the part that needs updating. If you draw more than that, XVT++ may, for efficiency, temporarily reduce the clipping area so that only the part that needs updating is actually drawn.

Don't assume that only one call to `e_update` will be generated when a window needs to be redrawn. XVT++ may call `e_update` several different times for different areas of the window, or may combine the areas into a single bounding rectangle. You also can't make any assumptions about when `e_update` will be called; it may be called any time after `e_create`.

It is usually best to organize your application so that most, if not all, drawing occurs in `e_update` functions, rather than drawing things as you go along. That way the occurrence of an update event will be the usual case rather than the exception, and the program is likely to be simpler and more reliable. For example, when the data structure representing the contents of a window changes, don't draw the changes immediately. Instead, after making changes to the data structure, induce an update event with `Invalidate`.

Don't induce an update event when it's important to draw right away, to keep up with the user or to show animation. For example, when the user selects an object with the mouse, immediately draw whatever is required to show the selection; waiting for the update event may cause a noticeable delay.

Also, don't induce an update event when the user operates a scrollbar. The window will scroll much faster if you move some pixels already there with a call to `Scroll`, rather than repainting the entire window.

A newly created visible window always gets an update event for its entire client area shortly after being created, so it is not necessary to draw into a new window.

When you are calling `Invalidate` several times to invalidate disjoint areas of the window, it may be advantageous to call `UpdateWindow` between calls to `Invalidate`. This allows each update rectangle to be handled individually. Otherwise, the several disjoint update rectangles may be merged into a single rectangle, causing your application to update more of the screen than is needed. If you do this, take into account that there will be a recursive call to your window's event handler.

Many XVT++ member functions cannot be called during the execution of an `e_update` member function; calling these functions causes a fatal error. This is usually due to side effects that these functions produce within the context of an update event. For example, calling a function that causes an update to be generated from within the processing of a previous update event can cause endless recursion.

XVT_DrawableContainer::e_user

RECEIVE NOTIFICATION OF A USER-DEFINED EVENT

Prototypes

```
virtual long
e_user(
        long                    id,
        void*                   data )
```

Parameters

`id`
The ID of the user-defined event.

`data`
The data associated with the user-defined event.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to user-defined events.

User-defined events are used for two purposes. Events with IDs ranging from 0 to 32767 can be defined by applications for whatever purpose they desire. All other IDs are reserved to XVT and can be

used to deliver platform-specific events under some circumstances. See the platform-specific books.

Note that there is no way to enqueue a user event on the native event queue. To deliver a user event, simply call `e_user` directly.

XVT_DrawableContainer::GetCtl

RETRIEVE THE CONTROL OBJECT ASSOCIATED WITH A CONTROL ID

Prototypes

```
XVT_Control*
GetCtl(
        long                    cid )
```

Parameters

`cid`
The control ID.

Return Value

A pointer to the associated control, or `NULL` if none was found.

XVT_DrawableContainer::GetCtlCount

RETRIEVE THE NUMBER OF CONTROLS IN THIS WINDOW

Prototypes

```
long
GetCtlCount() const
```

Return Value

The number of controls in the window.

XVT_DrawableContainer::GetEventMask

RETRIEVE THE CONTAINER'S EVENT MASK

Prototypes

```
EVENT_MASK
GetEventMask() const
```

Return Value

The current event mask.

Equivalent C Function

```
get_event_mask()
```

XVT_DrawableContainer::GetFirstCtl

RETRIEVE THE FIRST CONTROL IN THE LIST OF CONTROLS

Prototypes

```
XVT_Control*
GetFirstCtl()
```

Return Value

A pointer to the first control in the list of controls maintained by this window or `NULL` if there are no controls in the window.

Description

Retrieves the first control in the list of controls and resets the traversal context used by `GetNextCtl` to the beginning of the control list.

You can retrieve all controls (in no particular order) by calling `GetFirstCtl` and then calling `GetNextCtl` repeatedly until it returns `NULL`.

XVT_DrawableContainer::GetFirstWin

RETRIEVE THE FIRST WINDOW IN THE LIST OF CHILD WINDOWS

Prototypes

```
XVT_ChildBase*
GetFirstWin()
```

Return Value

A pointer to the first window in the list of child windows maintained by this window.

Description

Retrieves the first window in the list of child windows and resets the traversal context used by `GetNextWin` to the beginning of the window list.

You can retrieve all child windows (in no particular order) by calling `GetFirstWin` and then calling `GetNextWin` repeatedly until it returns `NULL`.

XVT_DrawableContainer::GetNextCtl

RETRIEVE THE NEXT CONTROL IN THE LIST OF CONTROLS

Prototypes

```
XVT_Control*
GetNextCtl()
```

Return Value

A pointer to the next control relative to the current traversal context, or `NULL` if we have reached the end of the list of controls.

Description

Retrieves the next control and increments the context.

You can retrieve all controls (in no particular order) by calling `GetFirstCtl` and then calling `GetNextCtl` repeatedly until it returns `NULL`.

XVT_DrawableContainer::GetNextWin

RETRIEVE THE NEXT WINDOW IN THE LIST OF CHILD WINDOWS

Prototypes

```
XVT_ChildBase*
GetNextWin()
```

Return Value

A pointer to the next window relative to the current traversal context, or `NULL` if the end of the list of windows has been reached.

Description

Retrieves the next window and increments the context.

You can retrieve all child windows (in no particular order) by calling `GetFirstWin` and then calling `GetNextWin` repeatedly until it returns `NULL`.

Equivalent C Function

```
list_windows()
```

XVT_DrawableContainer::GetWinCount

RETRIEVE THE NUMBER OF CHILD WINDOWS

Prototypes

```
long
GetWinCount() const
```

Return Value

The number of child windows contained by this window.

XVT_DrawableContainer::Invalidate

INVALIDATE AN AREA OF A WINDOW

Prototypes

```
void
Invalidate()

void
Invalidate(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The area to be invalidated.

Description

Marks an area of the window as being invalid. That area will be updated some time in the future.

This function is the preferred way to cause something to be drawn in a window.

`Invalidate()`
Invalidates the entire client area of the window.

`Invalidate( region )`
Invalidates the area defined by `boundary`.

Implementation Notes

XVT/Win, XVT/PM
The rectangle you are intend to invalidate should have its dimensions increased by one pixel on all sides; otherwise, pixels on the edges will not be redrawn correctly.

Equivalent C Function

`invalidate_rect()`

XVT_DrawableContainer::Scroll

SCROLL A RECTANGULAR REGION

Prototypes

```
void
Scroll(
        XVT_Rct             boundary,
        long                dh,
        long                dv )
```

Parameters

`boundary`
: The boundary of the scroll area. No pixels outside of the boundary are affected by the scroll.

`dh`
: Amount of horizontal scrolling in pixels. If `dh` > `boundary.Width`, the results are undefined.

`dv`
: Amount of vertical scrolling in pixels. If `dh` > `boundary.Height`, the results are undefined.

Description

Scrolls pixels inside a rectangular region.

A call to `e_update` is automatically generated for the part of the rectangle whose pixels were scrolled away. This call is made recursively, before `Scroll` returns. If the client area being scrolled is partially obscured by other windows, including child windows, then the resulting call or calls to `e_update` may encompass an area larger than just the rectangle exposed by the scrolling. Your application must not make assumptions about the calls to `e_update` that will be generated during scrolling.

This function is normally called when your application is changing the view of a document. Usually, your application keeps an internal data structure reflecting the view of the document, and part of the data structure indicates the origin of the window viewport into that document. Before you scroll a window's contents, you should first adjust your internal origin, so the recursively generated call to `e_update` event is encountered by an object whose origin has already been properly set.

If you are scrolling your window in response to an `e_vscroll` call, remember that when you receive a line up or page up event you want

to move the pixels downward so that the dv argument to Scroll is positive. When you get a line down or page down, dv will be negative. A similar relationship holds for calls to e_hscroll.

Before scrolling a window's pixels, you must ensure that the client area is valid, by calling UpdateWindow. This call should be made even before you change your application's internal viewport origin.

Equivalent C Function

win_scroll_rect()

XVT_DrawableContainer::SetEventMask

SET THE CONTAINER'S EVENT MASK

Prototypes

```
void
SetEventMask(
        EVENT_MASK              mask )
```

Parameters

mask
The new event mask.

Description

Sets the container's event mask. The event mask is a bitwise OR'd combination of masks, one for each type of event. If the mask bit is set, the corresponding event handler member function is called when that type of event occurs; otherwise, the event is ignored. In some cases applications will run more efficiently if undesired events are masked off rather than just ignored by the application. Valid event masks may be constructed by ORing together the following constants:

EM_NONE
No event handling member functions will be called.

EM_ALL
All event handling member functions will be called.

EM_CREATE
e_create will be called iff (if and only if) set.

EM_DESTROY
e_destroy will be called iff set.

EM_FOCUS
e_focus will be called iff set.

EM_SIZE
e_size will be called iff set.

EM_UPDATE
e_update will be called iff set.

EM_CLOSE
e_close will be called iff set.

EM_MOUSE_DOWN
e_mouse_down will be called iff set.

EM_MOUSE_UP
e_mouse_up will be called iff set.

EM_MOUSE_DBL
e_mouse_dbl will be called iff set.

EM_MOUSE_MOVE
e_mouse_move will be called iff set.

EM_CHAR
e_char will be called iff set.

EM_VSCROLL
e_vscroll will be called iff set.

EM_HSCROLL
e_hscroll will be called iff set.

EM_COMMAND
Menu-item action member functions of the associated menu will be called iff set.

EM_FONT
e_font will be called iff set.

EM_CONTROL
Control e_action member functions of contained controls will be called if set.

EM_TIMER
e_timer will be called iff set.

EM_USER
e_user will be called iff set.

Equivalent C Function

set_event_mask()

XVT_DrawableContainer::SetInnerRect

SET A WINDOW'S SIZE AND POSITION

Prototypes

```
void
SetInnerRect(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The rectangle giving the new coordinates of the window's client area relative to the task window, or relative to the screen if the native window system has no task window.

Description

This function moves and/or resizes a window such that its client rectangle has the coordinates given in `boundary`.

Implementation Notes

XVT/XM
The window manager may choose not to honor a move request.

Equivalent C Function

`move_window()`

Implementation Members

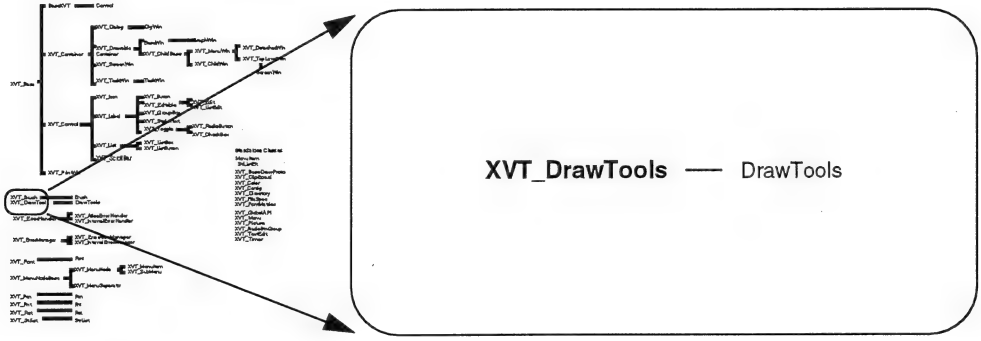
`XVT_DrawableContainer`
`~XVT_DrawableContainer`
`Install`
`RemoveWin`
`RemoveCtl`
`MoveProtocol`
`CloseProtocol`
`ControlEvent`

Inherited Member Functions

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_DrawTools



Overview

Header File	`tools.h`
Source File	`tools.cc`
Superclass	
Subclasses	`DrawTools`
Usage	Concrete

Instances of this class completely define how drawing primitives are rendered in a window. Each instance of `XVT_BaseDrawProto` maintains an instance of this structure as the current draw tools. The member functions `GetDrawTools` and `SetDrawTools` can be used to change the current drawing tools.

Constructors

```
XVT_DrawTools()
XVT_DrawTools(
    XVT_Pen          pen,
    XVT_Brush        brush,
    DRAW_MODE        mode,
    XVT_Font         font,
    XVT_Color        fore_color,
    XVT_Color        back_color,
    BOOLEAN          opaque_text )
XVT_DrawTools( const XVT_DrawTools& tools )
~XVT_DrawTools()
```

Operators

```
XVT_DrawTools& operator=( const XVT_DrawTools& tools )
```

Draw tools may be assigned.

Member Functions

XVT_DrawTools::GetBackColor

GET THE BACKGROUND COLOR

Prototypes

```
XVT_Color
GetBackColor() const
```

Return Value

A copy of the background color.

XVT_DrawTools::GetBrush

RETRIEVE THE BRUSH

Prototypes

```
XVT_Brush
GetBrush() const
```

Return Value

A copy of the draw tools' brush.

XVT_DrawTools::GetFont

RETRIEVE THE FONT

Prototypes

```
XVT_Font
GetFont() const
```

Return Value

A copy of the draw tools' font.

XVT_DrawTools::GetForeColor

GET THE FOREGROUND COLOR

Prototypes

```
XVT_Color
GetForeColor() const
```

Return Value

A copy of the draw tools' foreground color.

XVT_DrawTools::GetMode

RETRIEVE THE DRAWING MODE

Prototypes

```
DRAW_MODE
GetMode() const
```

Return Value

The drawing mode.

XVT_DrawTools::GetOpaqueText

GET THE OPAQUE TEXT FLAG

Prototypes

```
BOOLEAN
GetOpaqueText() const
```

Return Value

The opaque text flag.

XVT_DrawTools::GetPen

RETRIEVE THE PEN

Prototypes

```
XVT_Pen
GetPen() const
```

Return Value

A copy of the draw tools' pen.

XVT_DrawTools::SetBackColor

SET THE BACKGROUND COLOR

Prototypes

```
void
SetBackColor(
        XVT_Color               color )
```

Parameters

`color`
The new background color.

Description

Sets the draw tools' background color.

The background color is used for the spaces between hatch marks of a patterned brush, for the text background when text is opaque, and for the background of icons.

Do not confuse the background color set by this function with any sort of automatic background painting. Your application must explicitly paint a window in the background color during a call to `e_update`, usually by calling `Clear`.

XVT_DrawTools::SetBrush

SET THE BRUSH

Prototypes

```
void
SetBrush(
        XVT_Brush               brush )
```

Parameters

`brush`
The new brush.

Description

Sets the draw tools' brush.

XVT_DrawTools::SetFont

SET THE FONT

Prototypes

```
void
SetFont(
        XVT_Font                font )
```

Parameters

`font`
The font that will become the draw tools' font. It should have been generated by an `e_font` call, through `GetDrawTools`, or through `GetFont`.

Description

Sets the draw tools' font.

Implementation Notes

XVT/CH

The current font is ignored. All drawing is done in whatever font the screen supports.

XVT_DrawTools::SetForeColor

SET THE FOREGROUND COLOR

Prototypes

```
void
SetForeColor(
        XVT_Color               color )
```

Parameters

`color`

The new foreground color.

Description

Sets the draw tools' foreground color.

The foreground color is used only for drawing text and icons. Other drawing primitives take their colors from the current pen and brush.

XVT_DrawTools::SetMode

SET THE CURRENT DRAWING MODE

Prototypes

```
void
SetMode(
        DRAW_MODE               mode )
```

Parameters

`mode`

The new drawing mode.

Description

Sets the window's current drawing mode.

Drawing modes are defined by the DRAW_MODE enumeration, which has at least the following members:

M_COPY
: The normal drawing mode. The source pixels are copied to the screen, erasing any destination pixels underneath them.

M_XOR
: The source is XOR'd with the inverse (NOT) of the destination. This mode has the property that drawing the same thing twice is guaranteed to have no effect and that drawing something once is visible under most combinations of foreground and background colors.

M_OR
: The source pixels are OR'd with the destination pixels and the result is displayed on the screen.

M_CLEAR
: If the source pixel is set, it is written to the screen. The destination pixels are ignored.

M_NOT_COPY
: The inverse of the source pixels is copied to the screen.

M_NOT_XOR
: The inverse (NOT) of the source is XOR'd with the inverse (NOT) of the destination.

M_NOT_CLEAR
: If the source pixel is not set, its inverse is written to the screen. The destination pixels are ignored.

Implementation Notes

Use of modes other than M_COPY for printing is not portable.

XVT_DrawTools::SetOpaqueText

SET THE OPAQUE TEXT FLAG

Prototypes

```
void
SetOpaqueText(
        BOOLEAN                 ot )
```

Parameters

ot
: A flag that is TRUE if text is to be opaque and FALSE if it is to be transparent.

Description

If the opaque text flag is TRUE, the bounding rectangle of the text is drawn in the background color before the text itself is drawn in the foreground color.

XVT_DrawTools::SetPen

SET THE PEN

Prototypes

```
void
SetPen(
        XVT_Pen                 pen )
```

Parameters

pen
: The new pen.

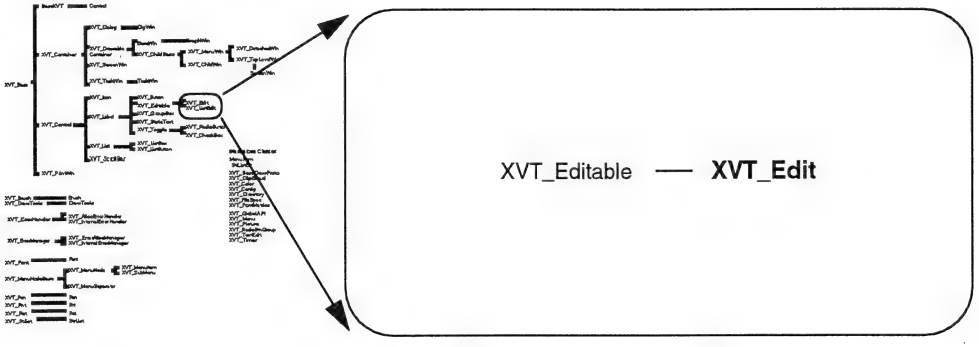
Description

Sets the draw tools' pen.

Implementation Members

ConvertTo
ConvertFrom
_Pen
_Brush
Mode
_Font
ForeColor
BackColor
OpaqueText

XVT_Edit



Overview

Header File	`edit.h`
Source File	`edit.cc`
Superclass	`XVT_Editable`
Subclasses	
Usage	Abstract

This class defines the interface to text entry field controls.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Edit field controls allow the user to input a text string to the application. These controls vary in their appearance and behavior depending on the native GUI platform being used. For example, some systems may provide small scrollbars for these controls on one or both ends of the control. Also, platforms handle the text scrolling differently. However, these controls always report events whenever the text string is modified or the keyboard focus is gained (or lost).

XVT edit field controls are always one line high.

Constructors

```
XVT_Edit( XVT_Dialog* parent, long cid )
XVT_Edit( XVT_DrawableContainer* parent, long cid )
```

Inherited Member Functions

From XVT_Editable

page 161 virtual void e_action()

page 162 e_focus(BOOLEANactive)

page 163 void SelectText(long first, long last)

From XVT_Label

page 239 void GetTitle(char* str, unsigned long* len)

page 239 virtual BOOLEAN Init(XVT_Rct boundary, long = 0L, char * = NULL)

page 240 void SetTitle(char* str)

From XVT_Control

page 92 virtual void Close()

page 93 virtual void e_create()

page 93 virtual void e_destroy()

page 94 virtual long e_user(long id, void *data)

page 95 BOOLEAN GetEnabledState()

page 95 long GetID(void)

page 95 XVT_Base *GetParent(void)

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

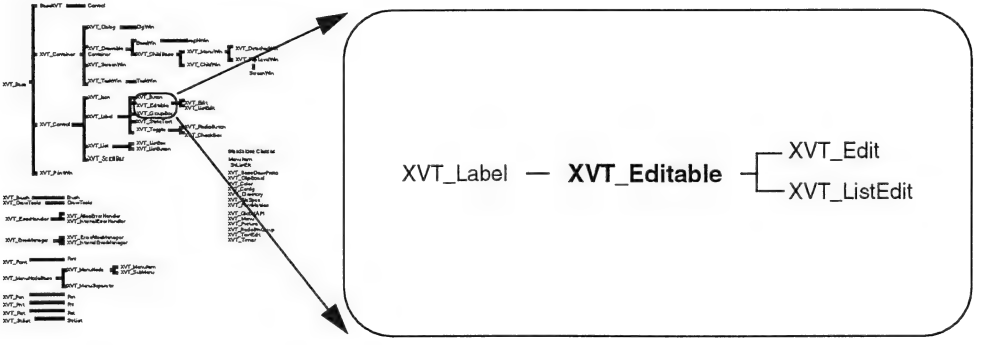
page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_Editable



Overview

Header File	`editable.h`
Source File	`editable.cc`
Superclass	`XVT_Label`
Subclasses	`XVT_Edit, XVT_ListEdit`
Usage	Implementation

This class defines the interface to text edit controls.

Member Functions

XVT_Editable::e_action

RECEIVE NOTIFICATION OF USER ACTIVITY

Prototypes

```
virtual void
e_action()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to activity in an edit field.

A call to this function is generated whenever the user modifies the contents of an edit field.

XVT_Editable::e_focus

RECEIVE NOTIFICATION OF KEYBOARD FOCUS CHANGE

Prototypes

```
virtual void
e_focus(
        BOOLEAN                 active )
```

Parameters

`active`
A flag that is `TRUE` if the edit control is gaining focus and `FALSE` if it is losing focus.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to focus changes involving the edit field.

Calls to this member function notify the application that an edit control has either gained or lost the keyboard focus.

For a given edit control, a call to `e_focus( TRUE )` is always guaranteed to be paired with either a subsequent call to `e_focus( FALSE )` or, if the edit control has been closed, a call to `e_destroy`. Deactivation events are always followed by activation events, and vice versa, until the edit control has been closed.

Implementation Notes

It is not possible to change the focus (with `MakeFront`) in response to an `e_focus` call.

XVT_Editable::SelectText

SELECT TEXT

Prototypes

```
void
SelectText(
        long                    first,
        long                    last )
```

Parameters

`first`
The first character in the new selection. Characters are indexed from zero.

`last`
The last character in the new selection.

Description

Modifies the current selection in an edit field.

If `first` and `last` are identical, the insertion point is changed.

Equivalent C Function

`win_select_item_text()`

Implementation Members

`XVT_Editable`

Inherited Member Functions

From XVT_Label

page 239 `void GetTitle( char* str, unsigned long* len )`

page 239 `virtual BOOLEAN Init( XVT_Rct boundary, long = 0L, char * = NULL )`

page 240 `void SetTitle( char* str )`

From XVT_Control

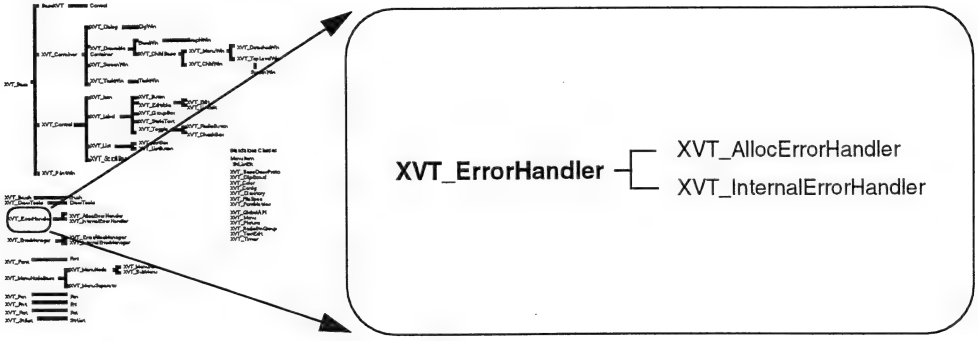
page 92 virtual void Close()
page 93 virtual void e_create()
page 93 virtual void e_destroy()
page 94 virtual long e_user(long id, void *data)
page 95 BOOLEAN GetEnabledState()
page 95 long GetID(void)
page 95 XVT_Base *GetParent(void)
page 96 BOOLEAN GetVisibleState()
page 96 void Init()
page 96 void MakeFront()
page 97 void SetEnabledState(BOOLEAN state)
page 98 void SetInnerRect(XVT_Rct boundary)
page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_ErrorHandler



Overview

Header File	`error.h`
Source File	`error.cc`
Superclass	
Subclasses	`XVT_AllocErrorHandler`, `XVT_InternalErrorHandler`
Usage	Abstract

This class defines the interface to an error handler. Error handlers are used in combination with error managers, which manage the handling of types of errors. For any type of error there is a subclass of `XVT_ErrorManager` and a subclass of `XVT_ErrorHandler`. Chains of error handlers are maintained by error managers and invoked using the error manager's `Raise` member function.

Constructors

`XVT_ErrorHandler( XVT_ErrorManager *manager )`
Create an error handler for the type of errors being handled by the given error manager. The newly created handler is pushed on the chain of handlers maintained by the error manager.

`virtual ~XVT_ErrorHandler()`

Member Functions

XVT_ErrorHandler::Handle

HANDLE AN ERROR

Prototypes

```
virtual BOOLEAN
Handle(
        long                    data ) = 0
```

Parameters

data
The data associated with the error.

Return Value

`TRUE` if the handler resolved the error condition and program execution can continue and `FALSE` if the next handler in the chain should be tried.

Description

By convention, subclasses provide a virtual function named `Handler` whose arguments correspond to those of `Raise` from the corresponding error manager. `Handle` is overridden in the subclass to unpack data into the original arguments passed to `Raise` and pass those to `Handler`, which will actually decide what to do.

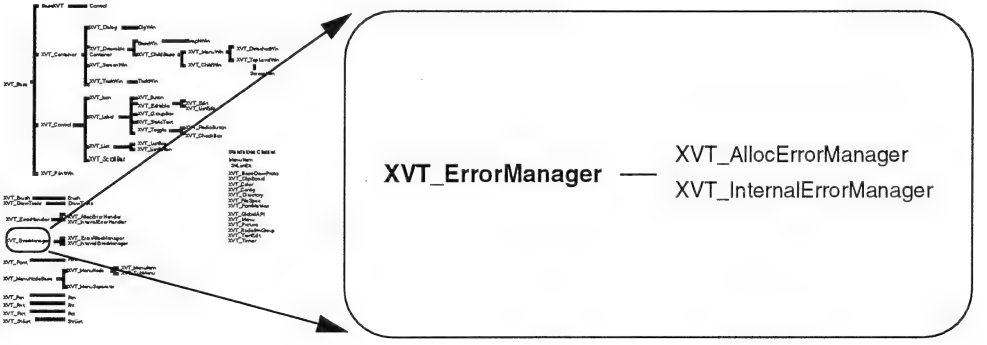
It is possible to create `Handler` implementations that call `longjmp`; however, before doing that, you should be aware that error handlers can be invoked from the bottom of arbitrarily deep recursion involving both your application code and the window system code. The chances of completing a jump and finding the window system

in operable condition are very poor. We suggest that you avoid `setjmp/longjmp` and instead just call `exit` from the handler directly after doing whatever cleanup you desire. That is the paradigm used by XVT++ handlers.

Implementation Members

`Manager`

XVT_ErrorManager



Overview

Header File	`error.h`
Source File	`error.cc`
Superclass	
Subclasses	`XVT_AllocErrorManager`, `XVT_InternalErrorManager`
Usage	Concrete

This class defines the interface common to all error managers.

An error manager manages the handling of a particular type of error, for example, memory allocation errors. Each new type of error requires an error manager subclass customized to handle it.

Constructors

```
XVT_ErrorManager()
~XVT_ErrorManager()
```

Member Functions

XVT_ErrorManager::Raise

RAISE AN ERROR

Prototypes

```
void
Raise(
        long                    data )
```

Parameters

`data`
The data associated with this error.

Return Value

If `Raise` returns, the user can assume that the error condition has been handled and that the operation that caused the condition may be retried.

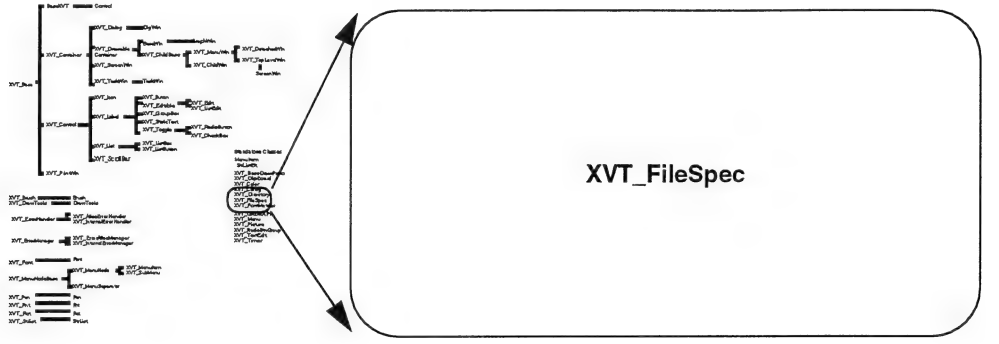
Description

Notifies the error manager that an error, described by `data`, has occurred. Usually, this function is not used directly. Instead, subclasses implement two raise functions, one with identical parameters to this one and one with a convenient set of parameters for the programmer (for example, a string, `__FILE__`, `__LINE__`). The latter function packs up its arguments and invokes the former, which in turn just calls this function.

Implementation Members

`PushHandler`
`RemoveHandler`
`Chain`

XVT_FileSpec



Overview

Header File	`filespec.h`
Source File	`filespec.cc`
Superclass	
Subclasses	
Usage	Concrete

Instances of this class specify files in a portable way. There are three parts to a file specification: the directory, the file name, and the file type. The directory is a portable directory represented by an instance of `XVT_Directory`. The file name and type are just strings. For portability, synthesized file names should be no longer than 8 characters and contain no spaces or control characters. Types should be a maximum of five characters.

Constructors

```
XVT_FileSpec( XVT_Directory dir, const char* type,
    const char* name )
XVT_FileSpec( const XVT_FileSpec& file_spec )
~XVT_FileSpec()
```

Operators

```
XVT_FileSpec& operator=( const XVT_FileSpec& file_spec )
```

Member Functions

XVT_FileSpec::GetDir

RETRIEVE THE DIRECTORY

Prototypes

```
XVT_Directory
GetDir() const
```

Return Value

The directory part of a file specification.

XVT_FileSpec::GetName

RETRIEVE THE FILE NAME

Prototypes

```
BOOLEAN
GetName(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the file name.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the file name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

XVT_FileSpec::GetType

RETRIEVE THE FILE TYPE

Prototypes

```
BOOLEAN
GetType(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the type name.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the type name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

XVT_FileSpec::SetDir

SET THE DIRECTORY

Prototypes

```
void
SetDir(
        XVT_Directory           d )
```

Parameters

`d`
The new directory part of the file specification.

Description

Sets the directory part of a file specification.

XVT_FileSpec::SetName

SET THE FILE NAME

Prototypes

```
void
SetName(
        const char*             str )
```

Parameters

str
The new file name.

Description

Sets the file name.

XVT_FileSpec::SetType

SET THE FILE TYPE

Prototypes

```
void
SetType(
        const char*             type )
```

Parameters

type
The new file type.

Description

Sets the file type.

Implementation Members

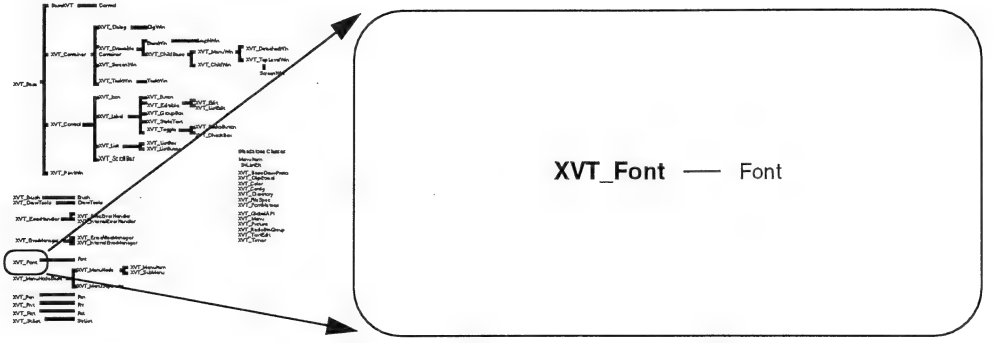
ConvertTo

Dir

Type

Name

XVT_Font



Overview

Header File	`tools.h`
Source File	`tools.cc`
Superclass	
Subclasses	`Font`
Usage	Concrete

Instances of the `XVT_Font` class specify particular fonts. The font object is entirely opaque. You cannot portably modify the internal components of a font once it has been instantiated.

The only legitimate ways to obtain an instance of this class are via an `e_font` member function, by calling `GetDrawTools`, or by constructing the font based on family style and size parameters.

Constructors

```
XVT_Font()
XVT_Font( long family, long style, short size )
```
Create a font that best matches the given family, style and size. Equivalent to the C function `select_font`.

```
XVT_Font( const XVT_Font& font )
~XVT_Font()
```

Operators

```
XVT_Font& operator=( const XVT_Font& font )
```
Fonts may be assigned.

Member Functions

XVT_Font::GetSize

RETRIEVE THE FONT'S SIZE

Prototypes

```
short
GetSize() const
```

Return Value

The font's size.

XVT_Font::SetSize

SET THE FONT'S SIZE

Prototypes

```
void
SetSize(
        short size )
```

Parameters

`size`
The new font size.

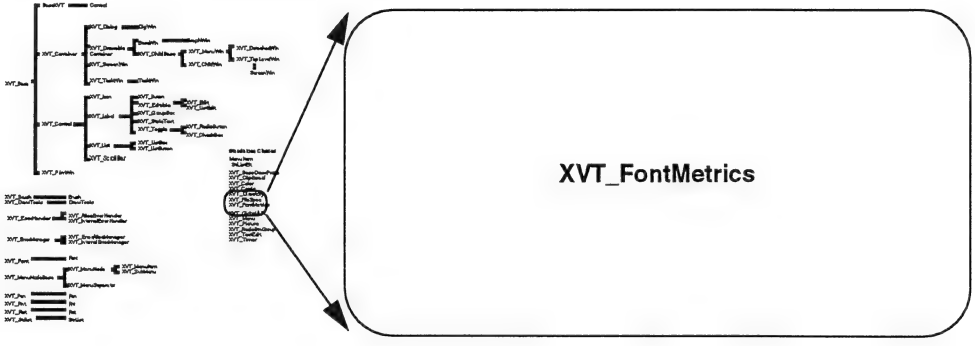
Description

Set the font's size.

Implementation Members

`GetStyle`
`SetStyle`
`GetFamily`
`SetFamily`
`ConvertTo`
`ConvertFrom`
`Style`
`Family`
`Size`

XVT_FontMetrics



Overview

Header File	`tools.h`
Source File	`tools.cc`
Superclass	
Subclasses	
Usage	Concrete

Instances of the `XVT_FontMetrics` class describe a font in terms of its leading, ascent, and descent. Instances of this class are used to provide data to the application's text setting computations.

Usually, instances of this class are obtained from the member function `XVT_BaseDrawProto::GetFontMetrics`.

To single-space a font, augment the y coordinate of each successive line of text by the sum of the ascent, descent, and leading.

Constructors

```
XVT_FontMetrics(
    long leading = 0,
    long ascent = 0,
    long descent = 0 )
XVT_FontMetrics( const XVT_FontMetrics& Metrics )
~XVT_FontMetrics
```

Operators

```
XVT_FontMetrics& operator=(
    const XVT_FontMetrics& metrics )
BOOLEAN operator==( const XVT_FontMetrics& metrics )
```

Member Functions

XVT_FontMetrics::GetAscent

RETRIEVE THE ASCENT

Prototypes

```
long
GetAscent() const
```

Return Value

The ascent.

XVT_FontMetrics::GetDescent

RETRIEVE THE DESCENT

Prototypes

```
long
GetDescent() const
```

Return Value

The descent.

XVT_FontMetrics::GetLeading

RETRIEVE THE LEADING

Prototypes

```
long
GetLeading() const
```

Return Value

The leading.

XVT_FontMetrics::SetAscent

SET THE ASCENT

Prototypes

```
void
SetAscent(
        long                    ascent )
```

Parameters

ascent
The new ascent.

Description

Sets the ascent.

The ascent is the distance from the baseline to the top of the tallest character in a font.

XVT_FontMetrics::SetDescent

SET THE DESCENT

Prototypes

```
void
SetDescent(
        long                    descent )
```

Parameters

`descent`
The new descent.

Description

Sets the descent.

The descent is the distance from the baseline to the bottom of the lowest character.

XVT_FontMetrics::SetLeading

SET THE LEADING

Prototypes

```
void
SetLeading(
        long                    l )
```

Parameters

`l`
The new leading.

Description

Sets the leading.

The leading is the distance between the baselines of adjacent (single-spaced) lines of text minus the ascent and descent.

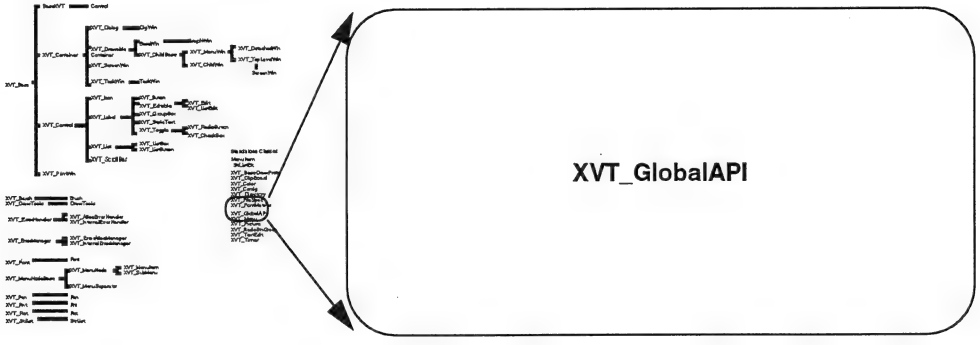
Implementation Members

`Leading`

`Ascent`

`Descent`

XVT_GlobalAPI



Overview

Header File	gapi.h
Source File	gapi.cc
Superclass	
Subclasses	
Usage	Concrete

The global API class provides access to functionality that doesn't really fit in any other class. Instances of this class are stateless so you can create and delete them as needed.

Example

The following example shows how to obtain the current directory.

```
{
    XVT_GlobalAPI gapi;
    XVT_Directory theDir;

    theDir = gapi.GetDir();
    .
    .
}
```

Constructors

```
XVT_GlobalAPI()
~XVT_GlobalAPI()
```

Member Functions

XVT_GlobalAPI::About

DISPLAY AN ABOUT DIALOG

Prototypes

```
void
About()
```

Description

Displays an about dialog as specified by the `XVT_Config` structure given to the task window. XVT provides a standard about box resource in **url.h**. You may override the standard about box by using `XVT_Config::SetAboutBoxID` to your own about box resource ID.

If you choose to specify your own about dialog resource, it should contain buttons with control IDs of `DLG_CANCEL` and `DLG_OK` in addition to whatever static text or icons you desire. If the user presses `DLG_OK`, `About` calls `Help`. If the user presses `DLG_CANCEL`, `About` dismisses the about dialog.

Equivalent C Function

```
about_box()
```

XVT_GlobalAPI::Ask

ASK THE USER A QUESTION

Prototypes

```
ASK_RESPONSE
Ask(
        const char*         lbl_dflt,
        const char*         lbl2,
        const char*         lbl3,
        const char*         fmt... )
```

Parameters

`lbl_dflt`
The title for the default button.

`lbl2`
The title for the second response button. Passing a `NULL` value causes the second response button not to be displayed.

`lbl3`
The title for the third response button. Passing a `NULL` value causes the third response button not to be displayed.

`fmt`
The question, a `printf` style format string and arguments. The total length of the formatted question must be less than 200 characters.

Return Value

`RESP_DEFAULT`
The user clicked on the button whose title was given by `lbl_dflt`.

`RESP_2`
The user clicked on the button whose title was given by `lbl2`.

`RESP_3`
The user clicked on the button whose title was given by `lbl3`.

Description

Puts up a dialog that asks the user a question and offers two or three possible responses. For a dialog with just one response, use `Note` or `Error`.

Equivalent C Function

`xvt_ask()`

XVT_GlobalAPI::Beep

PRODUCE AN AUDIBLE BEEP

Prototypes

```
void
Beep()
```

Description

Makes a standard beep sound. Usually used to indicate an error.

Equivalent C Function

xvt_beep()

XVT_GlobalAPI::ChgDir

CHANGE THE CURRENT DIRECTORY

Prototypes

```
void
ChgDir(
        XVT_Directory          dir )
```

Parameters

dir
: The new current directory.

Description

Changes the current directory.

Equivalent C Function

chg_dir()

XVT_GlobalAPI::Debug

APPEND DEBUG INFORMATION TO A FILE

Prototypes

```
void
Debug(
        const char*            fmt ... )
```

Parameters

fmt
: An sprintf-style format and arguments that yield the debug message. If a NULL is passed, the debug file will be closed and re-opened.

Description

Appends a debug message to a file. The file is named **DEBUG** and it appears in the directory that was current when the first call to Debug was made.

Equivalent C Function

```
xvt_dbg()
```

XVT_GlobalAPI::Debug2

CONDITIONALLY APPEND DEBUG INFORMATION TO A FILE

Prototypes

```
void
Debug2(
        const char*             fmt ... )
```

Parameters

`fmt`

An `sprintf`-style format and arguments that yield the debug message. If a `NULL` is passed, the debug file will be closed and re-opened.

Description

This function behaves identically to `Debug` if the preprocessor symbol `DEBUG` is defined when the file containing this call is compiled and a file named **XVTDEBUG** is present in the startup directory. If either of those conditions is not met, this function does nothing.

Equivalent C Function

```
dbg2()
```

XVT_GlobalAPI::Error

DISPLAY AN ALERT BOX WITH AN ERROR ICON

Prototypes

```
void
Error(
        const char*             fmt... )
```

Parameters

`fmt`
An `sprintf`-style format and arguments that give the error message. The total length of the formatted message must be less than 200 characters.

Description

Puts up an alert box containing an error message, an error icon, and an OK button. When the user presses OK, the dialog completes and `Error` returns. This dialog should be used only to indicate recoverable errors on the part of the user. Application errors should be communicated using `Fatal` or `Message`.

Equivalent C Function

`xvt_error()`

XVT_GlobalAPI::Fatal

DISPLAY AN ALERT BOX AND TERMINATE

Prototypes

```
void
Fatal(
        const char*             fmt... )
```

Parameters

`fmt`
An `sprintf`-style format and arguments that give the error message. The total length of the formatted message must be less than 200 characters.

Description

Puts up an alert box containing an error message, an error icon, and an OK button. When the user presses OK, the dialog completes and the application is terminated. The error message is also written to a file called **DEBUG** in case attempting to display the dialog causes a crash.

Equivalent C Function

`xvt_fatal()`

XVT_GlobalAPI::FindEOL

BREAK AN ARRAY OF CHARACTERS INTO INDIVIDUAL LINES

Prototypes

```
char*
FindEOL(
        const char*          buffer,
        long                 nbytes,
        long*                len,
        EOL_FORMAT*          fp )
```

Parameters

`buffer`
The string to scan for end-of-lines or `NULL` to indicate that the scan is to continue from where it left off.

`nbytes`
The number of bytes in buffer.

`len`
The length of the returned line.

`fp`
The type of line-end sequence. If the value returned is `EOL_NORMAL`, it indicates that the line was terminated, using the same termination sequence as the first line. A value of `EOL_DIFF` indicates that different line termination sequences have been detected, and a value of `EOL_NONE` indicates that the final line was not terminated by an EOL sequence.

Return Value

A pointer to the start of the line, or `NULL` if no lines remain.

Description

Breaks an array of characters into individual lines by searching for native end-of-line sequences. Initially this function should be called with a string argument for `buffer`. Subsequent calls should pass a `NULL` value for `buffer` indicating that the value provided in the initial call should be used. `FindEOL` will continue to return lines until it reaches the end of `buffer` at which point it will return `NULL`.

Equivalent C Function

`find_eol()`

XVT_GlobalAPI::GAlloc

ALLOCATE A GLOBAL MEMORY BLOCK

Prototypes

```
GHANDLE
GAlloc(
        long                    size )
```

Parameters

`size`
The size in bytes of the block of memory to allocate.

Return Value

A valid `GHANDLE` if successful, `(GHANDLE)0` if not.

Description

This function allocates memory from the "global" heap. The global heap is a separate memory manager that has special characteristics that vary between platforms. You may consider using global memory to reduce heap fragmentation on the Mac and Windows platforms.

This function returns a `GHANDLE` representing the memory allocated. A `GHANDLE` is *not* a pointer. To get a pointer to the memory, you call `GLock` and pass it to `GHANDLE`. When you are not using the pointer, you call `GUnlock` to allow the system to possibly move the memory block and defragment the heap.

Once a global memory block is allocated, you can get its size with `GSize`, resize it with `GReAlloc`, or free it with `GFree`.

You must not assume that the portable use of XVT global memory supports any of the tricks available on the Mac or Windows. In particular, global memory is *not* shared memory! Do not attempt to pass `GHANDLE`s from one application to another, any more than you would pass a pointer from one application to another.

Implementation Notes

XVT/Mac

If you are planning to run your application on the Mac, then you can use `GAlloc` to allocate memory that can be moved by the Mac operating system to another location. Doing so avoids heap fragmentation, and allows your application to use less memory. Typically, the memory saved is on the order of 20%. Of course,

the trade-off is that your application requires more complexity to manage the locking and unlocking required to use global memory, and will suffer a performance hit due to the locking and unlocking overhead.

XVT/Win

If you are planning to run your application on Windows, then using `GAlloc` will allocate memory segments that can be moved by the operating system. However, there are three problems with this approach. First, the number of memory blocks that can be allocated via `GAlloc` is limited to about 2000. Second, each memory block carries at least 30 bytes of overhead. Third, the performance of global memory is poor (typically 40 times slower than an average heap manager). Therefore, on Windows, there is no way to get the heap-defragmentation benefits of movable memory without these penalties.

If you do not use global memory, and instead allow the heap to be fragmented, then additional memory will be used. This, in turn, will manifest itself as some additional disk access, since Windows uses virtual memory. In our opinion, the additional disk access is still faster than using global memory.

Equivalent C Function

`galloc()`

XVT_GlobalAPI::GetAttrValue

RETRIEVE A VALUE FROM THE SYSTEM ATTRIBUTE TABLE

Prototypes

```
long
GetAttrValue(
        XVT_Base*               win,
        long                    attribute )
```

Parameters

`win`

The window whose attribute is to be modified, or `NULL` if no window is applicable.

`attribute`

The attribute code.

Return Value

The value of the given attribute.

Equivalent C Function

```
get_value()
```

XVT_GlobalAPI::GetDefaultBackColor

RETRIEVE THE DEFAULT BACKGROUND COLOR

Prototypes

```
XVT_Color
GetDefaultBackColor()
```

Return Value

The systemwide default background color. This function returns an `XVT_Color` object that can be used directly in calls to the drawing functions. See the description of the `ATTR_BACK_COLOR` attribute on page 210.

Equivalent C Function

```
get_front_top_level_window()
```

XVT_GlobalAPI::GetFrontTopLevelWin

RETRIEVE THE FRONTMOST TOP-LEVEL WINDOW

Prototypes

```
XVT_MenuWin*
GetFrontTopLevelWin()
```

Return Value

The frontmost top-level window. A top-level window is one whose parent is either the task window or the screen window.

Equivalent C Function

```
get_front_top_level_window()
```

XVT_GlobalAPI::GetFrontWin

GET THE FRONTMOST WINDOW

Prototypes

```
XVT_ChildBase*
GetFrontWin()
```

Return Value

The frontmost window with keyboard focus.

Equivalent C Function

```
get_front_window()
```

XVT_GlobalAPI::GetDefaultDir

RETRIEVE THE DEFAULT DIRECTORY

Prototypes

```
XVT_Directory
GetDefaultDir()
```

Return Value

The default directory. The default directory is the conceptual representation of the current directory, equivalent to "." in UNIX, DOS, and OS/2 systems. It is distinct from the value returned by `GetDir`, which is simply a particular directory that happens to be current at that time.

Equivalent C Function

```
get_default_dir()
```

XVT_GlobalAPI::GetDialogUserData

RETRIEVE USER DATA ASSOCIATED WITH A CONTROL IN A DIALOG

Prototypes

```
BOOLEAN
GetDialogUserData(
        char*                   buffer,
        long                    rid,
        long                    cid,
        long                    data_tag,
        unsigned long*          len )
```

Parameters

`buffer`
The buffer for the user data string.

`rid`
The resource ID of the dialog.

`cid`
The control-ID of the control. If `cid` is 0, the user data for the dialog is returned.

`data_tag`
The index of the user data. Indexes start at 0 and increase.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the user data, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length. If `len` is 0, no such user data exists.

Description

Retrieves user data associated with a control in a dialog or with a dialog.

Equivalent C Function

`get_dialog_userdata()`

XVT_GlobalAPI::GetDir

RETRIEVE THE CURRENT DIRECTORY

Prototypes

```
XVT_Directory
GetDir()
```

Return Value

The current directory.

Equivalent C Function

```
get_dir()
```

XVT_GlobalAPI::GetMenuUserData

RETRIEVE USER DATA ASSOCIATED WITH A MENU ITEM

Prototypes

```
BOOLEAN
GetMenuUserData(
        char*                   buffer,
        long                    rid,
        MENU_TAG                menu_tag,
        long                    data_tag,
        unsigned long*          len )
```

Parameters

`buffer`
The buffer for the user data string.

`rid`
The resource ID of the menu.

`menu_tag`
The tag of the menu item.

`data_tag`
The index of the user data. Indexes start at 0 and increase.

`len`
A pointer to the length of buffer.

Return Value

TRUE if the length of buffer was sufficient to hold the user data, FALSE if not. If FALSE is returned, len is set to the required length. If len is 0, no such user data exists.

Description

Retrieves user data associated with a menu item.

Equivalent C Function

```
get_menu_userdata()
```

XVT_GlobalAPI::GetResString

RETRIEVE A STRING FROM RESOURCES

Prototypes

```
BOOLEAN
GetResString(
        char*                   buffer,
        long                    rid,
        unsigned long*          len )
```

Parameters

buffer
: The buffer for the resource string.

rid
: The resource ID of the string.

len
: A pointer to the length of buffer.

Return Value

TRUE if the length of buffer was sufficient to hold the string, FALSE if not. If FALSE is returned, len is set to the required length.

Description

Retrieves a string from resources.

Equivalent C Function

```
get_res_str()
```

XVT_GlobalAPI::GetWindowUserData

RETRIEVE USER DATA ASSOCIATED WITH A CONTROL IN A WINDOW

Prototypes

```
BOOLEAN
GetWindowUserData(
        char*                   buffer,
        long                    rid,
        long                    cid,
        long                    data_tag,
        unsigned long*          len )
```

Parameters

`buffer`
The buffer for the user data string.

`rid`
The resource ID of the window.

`cid`
The control-ID of the control. If `cid` is 0, the user data for the window is returned.

`data_tag`
The index of the user data. Indexes start at 0 and increase.

`len`
A pointer to the length of `buffer`.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the user data, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length. If `len` is 0, no such user data exists.

Description

Retrieves user data associated with a control in a window or with a window.

Equivalent C Function

`get_window_userdata()`

XVT_GlobalAPI::GFree

FREE A BLOCK OF GLOBAL MEMORY

Prototypes

```
void
GFree(
        GHANDLE                 handle )
```

Parameters

`handle`
The handle to the block to be freed.

Description

Frees a block of global memory.

Equivalent C Function

`gfree()`

XVT_GlobalAPI::GLock

LOCK DOWN A GLOBAL BLOCK OF MEMORY

Prototypes

```
char*
GLock(
        GHANDLE                 handle )
```

Parameters

`handle`
The handle to the block to be locked down.

Return Value

A pointer to the memory block itself.

Description

Locks down a global block of memory. The memory will not be relocated by the system until the block is unlocked.

Equivalent C Function

`glock()`

XVT_GlobalAPI::GReAlloc

RESIZE A GLOBAL BLOCK OF MEMORY

Prototypes

```
GHANDLE
GReAlloc(
        GHANDLE                 handle,
        long                    size )
```

Parameters

`handle`
The handle to be resized.

`size`
The new size of the block.

Return Value

A valid `GHANDLE` if successful, `(GHANDLE)0` if not.

Description

Resizes a global block of memory to have size `size`. As the address of the block may change, the block should be unlocked before calling this function.

Equivalent C Function

`grealloc()`

XVT_GlobalAPI::GSize

RETRIEVE THE SIZE OF A GLOBAL BLOCK

Prototypes

```
long
GSize(
        GHANDLE                 handle )
```

Parameters

`handle`
A handle to a block of global memory.

Return Value

The size of the global block of memory.

Equivalent C Function

gsize()

XVT_GlobalAPI::GUnLock

UNLOCK A BLOCK OF MEMORY

Prototypes

```
void
GUnLock(
        GHANDLE                 handle )
```

Parameters

handle
The handle of the block to be unlocked.

Description

Unlocks a block of memory.

Equivalent C Function

gunlock()

XVT_GlobalAPI::Help

ENTER THE HELP SYSTEM

Prototypes

```
void
Help()
```

Description

Enters the help system. XVT++'s help system consists of a modeless "Topics" dialog box, as well as a variable number of "Help Text" dialogs that XVT++ creates and destroys as the user browses the help system. Calling `Help` creates the "Topics" dialog. Since the "Topics" dialog is modeless, `Help` returns immediately after displaying the dialog. This allows the user to access the help system and the rest of the application simultaneously.

When `Help` is called, XVT++ first tries to locate a help file that was compiled with **CCHELP**, whose name is determined by the base

application name from the XVT_Config instance passed to the task windows Init. This file is sought in the startup directory. If XVT can't find the file, it prompts the user to find it by calling OpenFile. If the user cannot find the help file, then the help system aborts. Once the file is opened, the "Topics" dialog is displayed. The user can respond to the dialog box by choosing a topic or cancelling it. If the user chooses to cancel, they leave the help system. If the user chooses a topic, the text of the topic is displayed in a "Help Text" dialog box.

There are two cases where XVT++ will automatically call Help without the intervention of your application. The first case is when the user presses the OK button in your application's About box. The second case where XVT++ will automatically call Help is when the user chooses from your menubar a menu item with tag equal to M_HELP.

Equivalent C Function

```
xvt_help()
```

XVT_GlobalAPI::ListFaces

LIST AVAILABLE TYPEFACES

Prototypes

```
void
ListFaces(
        XVT_StrList*          list )
```

Parameters

list
The string list to which the available typefaces are to be added.

Description

Lists available typefaces.

Equivalent C Function

```
list_faces()
```

XVT_GlobalAPI::ListResStrings

RETRIEVE STRINGS WITH CONSECUTIVE RESOURCEIDS

Prototypes

```
void
ListResStrings(
        XVT_StrList*            dest,
        long                    rid_first,
        long                    rid_last )
```

Parameters

`dest`
The string list to which the strings will be added.

`rid_first`
The resource ID of the first string.

`rid_last`
The resource ID of the last string.

Description

Retrieves strings with consecutive resource IDs from the resource file.

Equivalent C Function

`list_res_str()`

XVT_GlobalAPI::Message

DISPLAY AN EMERGENCY MESSAGE

Prototypes

```
void
Message(
        const char*             fmt... )
```

Parameters

`fmt`
An `sprintf`-style format and arguments that give the error message. The total length of the formatted message must be less than 200 characters.

Description

Puts up an alert box containing an error message, an error icon, and an OK button. When the user presses OK, the dialog completes and `Message` returns. The dialog put up does not come from resources and should not cause any extra memory or resources to be allocated so it can be successfully displayed in out-of-memory conditions.

Equivalent C Function

`xvt_msg()`

XVT_GlobalAPI::Note

DISPLAY AN ALERT BOX WITH A NOTE ICON

Prototypes

```
void
Note(
        const char*             fmt... )
```

Parameters

`fmt`

An `sprintf`-style format and arguments that give the error message. The total length of the formatted message must be less than 200 characters.

Description

Puts up an alert box containing a message, a note icon, and an OK button. When the user presses OK, the dialog completes and `Note` returns.

Equivalent C Function

`xvt_note()`

XVT_GlobalAPI::OpenFile

GET A FILE TO READ WITH A STANDARD DIALOG

Prototypes

```
FL_STATUS
OpenFile(
        XVT_FileSpec*           file_spec,
        const char*             str )
```

Parameters

`file_spec`
The file specification to open. Set the type to be the type of files the user is allowed to select; "" for any type. Set the directory to be the directory initially presented to the user.

`str`
A message to be displayed to the user in the dialog, "Select drawing file...", for example.

Return Value

`FL_OK`
The user clicked on the OK button and selected a file. The file specification pointed to by `file_spec` is now valid.

`FL_BAD`
An error occurred. An alert has already been displayed by the dialog.

`FL_CANCEL`
The user canceled the dialog.

Description

Puts up a dialog box that requests the user to select a file to be opened for reading. The file is not opened; only the file specification is returned. Upon return your application must change to the proper directory, check that the file exists and is readable and finally, open it.

Implementation Notes

XVT/Mac
The file type portion of the file specification is ignored. Users can select any type of file.

Equivalent C Function

`open_file_dlg()`

XVT_GlobalAPI::PageSetup

DISPLAY THE STANDARD PAGE SETUP DIALOG

Prototypes

```
BOOLEAN
PageSetup(
        char*                   print_record )
```

Parameters

`print_record`
The print record.

Return Value

A flag that is `TRUE` if the given print record was modified, `FALSE` if not.

Description

Puts up a dialog box allowing the user to adjust the page setup stored in the given print record. It should be called in response to the user's choosing page setup on the file menu. If your application has just read the print record from a file, you should first call `ValidatePrintRcd` to make sure that the record is valid.

Implementation Notes

XVT/CH, XVT/XOL, XVT/XM
This function is not implemented and always returns `FALSE` without ever displaying a dialog.

Equivalent C Function

`page_setup_dlg()`

XVT_GlobalAPI::ProcessEvents

PROCESS PENDING EVENTS

Prototypes

```
void
ProcessEvents()
```

Description

This function causes XVT++ to empty the event queue of all pending events and to dispatch them to the appropriate event handler method functions. After all events have been dispatched and the functions that received them have returned, `ProcessEvents` returns.

If you call `ProcessEvents`, you might receive a recursive call to an event handling member function. You should plan carefully for this by, among other things, restricting the use of global variables. In particular, make sure that the recursive call won't end up calling `ProcessEvents` again.

Calling `ProcessEvents` during an otherwise unbroken operation (such as loading a file), allows user input to be processed.

Therefore, call this function often (every 1/10th second suffices) during long operations, such as reading or writing a file, or when performing a time-consuming computation such as sorting. During that operation you might put up a dialog box that offers the user the opportunity to Cancel. You must call `ProcessEvents` for the dialog to function.

Implementation Notes

XVT/Mac, XVT/Win, XVT/PM

Calling `ProcessEvents` gives other applications a chance to execute.

Equivalent C Function

```
process_events()
```

XVT_GlobalAPI::ReadAccess

CHECK TO SEE IF FILE IS READABLE

Prototypes

```
BOOLEAN
ReadAccess(
        const char*             path )
```

Parameters

`path`

The file's pathname.

Return Value

A flag which is `TRUE` if the file is readable, `FALSE` if it is not.

XVT_GlobalAPI::Response

Obtain a string from the user

Prototypes

```
char*
Response(
        char*                   prompt,
        char*                   response,
        unsigned long           resp_len )
```

Parameters

`prompt`
The prompt to display. Only about 100 characters of prompt message can be displayed by the dialog.

`response`
The response buffer. On entry the value in this buffer will be used as the default response - it will be loaded into the text entry field and selected when the response dialog comes up. On exit it will contain whatever the user entered into the text entry field.

`resp_len`
The length of the response buffer in bytes.

Return Value

A pointer to the response buffer if the user entered a response, `NULL` if the dialog was cancelled.

Description

Obtain a character string from the user by bringing up a modal dialog which displays a prompt and allows the user to enter a response or cancel the dialog.

Equivalent C Function

`get_str_response()`

XVT_GlobalAPI::RestoreDir

RESTORE THE CURRENT DIRECTORY

Prototypes

```
void
RestoreDir()
```

Description

Restores (changes directory to) the directory saved by the last call to `SaveDir()`.

Equivalent C Function

`restore_dir()`

XVT_GlobalAPI::SaveDir

SAVE THE CURRENT DIRECTORY

Prototypes

```
void
SaveDir()
```

Description

Saves the current directory. This call causes the previously saved directory to be forgotten.

Equivalent C Function

`save_dir()`

XVT_GlobalAPI::SaveFile

GET A FILE TO WRITE WITH A STANDARD DIALOG

Prototypes

```
FL_STATUS
SaveFile(
        XVT_FileSpec*           file_spec,
        const char*             str )
```

Parameters

`file_spec`
The file specification to open. Set the type to be the type of files the user is allowed to select; "" for any type. Set the directory to be the directory initially presented to the user.

`str`
A message to be displayed to the user in the dialog, "Select drawing file...", for example.

Return Value

FL_OK
: The user clicked on the OK button and selected a file. The file specification pointed to by `file_spec` is now valid.

FL_BAD
: An error occurred. An alert has already been displayed by the dialog.

FL_CANCEL
: The user canceled the dialog.

Description

Puts up a dialog box that requests the user to select a file to be opened for writing. The file is not opened; only the file specification is returned. Upon return your application must change to the proper directory, and open the file. If the file exists, your application should prompt the user before overwriting it.

Implementation Notes

XVT/Mac
: The file type portion of the file specification is ignored. Users can select any type of file.

Equivalent C Function

`save_file_dlg()`

XVT_GlobalAPI::SetAttrValue

SET AN ATTRIBUTE VALUE

Prototypes

```
void
SetAttrValue(
        XVT_Base*           win,
        long                attribute,
        long                value )
```

Parameters

`win`
: The object whose attribute is to be modified, or `NULL` if no object is applicable.

`attribute`
The attribute code. Attribute codes are given by `ATTR` constants.

`value`
The new value for the attribute.

Description

Modifies an entry in the system attribute table.

The `ATTR_*` constants consist of two types of values: values that are defined to be portable across all window systems, and values that are defined to be specific for a particular platform. These constants are used as the `attr` argument for `SetAttrValue` and `GetAttrValue`. In this section, only the attributes that are portable across all platforms are described. For a detailed description of the platform-specific attributes, refer to the platform-specific books.

`ATTR_CH_*`

Description:
XVT/CH platform-specific attributes.

See also:
XVT/CH platform-specific book

`ATTR_MAC_*`

Description:
XVT/Mac platform-specific attributes.

See also:
XVT/Mac platform-specific book

`ATTR_PM_*`

Description:
XVT/PM platform-specific attributes.

See also:
XVT/PM platform-specific book

`ATTR_WIN_*`

Description:
XVT/Win platform-specific attributes.

See also:
XVT/Win platform-specific book

`ATTR_WIN_PM_*`

Description:
Platform-specific attributes that are common to XVT/Win and XVT/PM.

See also:
XVT/Win and *XVT/PM* platform-specific books

`ATTR_XM_*`

Description:
XVT/XM platform-specific attributes.

See also:
XVT/XM platform-specific book

`ATTR_XOL_*`

Description:
XVT/XOL platform-specific attributes.

See also:
XVT/XOL platform-specific book

`ATTR_X_*`

Description:
Platform-specific attributes common to XVT/XM and XVT/XOL.

See also:
XVT/XM and *XVT/XOL* platform-specific books

`ATTR_BACK_COLOR`

Description:
The system-wide window background `COLOR` as set by the user. Applications wishing to honor the user's settings can retrieve this color and use it in their calls to `Clear`. Be sure not to confuse this with the XVT++ drawing tools background color.

Uses `win` argument:
no

`GetValue` returns:
the user's choice of window background color

`SetValue` effect:
invalid

See also:
`Clear`

ATTR_CTL_BUTTON_HEIGHT

Description:
The best-looking button height, in pixels. This value should be used to create button controls that look optimal. The optimal button width depends on the width of its label, which can be measured by calling GetTextWidth with the system font.

Uses win argument:
no

GetValue returns:
button height

SetValue effect:
invalid

ATTR_CTL_CHECK_BOX_HEIGHT

Description:
The best-looking check box height, in pixels. This value should be used to create check box controls that look optimal. The optimal check box width depends on the width of its label, which can be measured by calling GetTextWidth with the system font.

Uses win argument:
no

GetValue returns:
check box height

SetValue effect:
invalid

ATTR_CTL_EDIT_TEXT_HEIGHT

Description:
The best-looking edit control height, in pixels. This value should be used to create edit controls that look optimal.

Uses win argument:
no

GetValue returns:
edit control height

SetValue effect:
invalid

ATTR_CTL_HORZ_SBAR_HEIGHT

Description:
The best-looking horizontal scrollbar thickness, in pixels. This value is the same as the thickness of horizontal scrollbars that are created by specifying WSF_HSCROLL when creating a window.

Uses win argument:
no

GetValue returns:
scrollbar thickness

SetValue effect:
invalid

ATTR_CTL_RADIOBUTTON_HEIGHT

Description:
The best-looking radio button height, in pixels. This value should be used to create radio button controls that look optimal. The optimal radio button width depends on the width of its label, which can be measured by calling GetTextWidth with the system font.

Uses win argument:
no

GetValue returns:
radio button height

SetValue effect:
invalid

ATTR_CTL_STATIC_TEXT_HEIGHT

Description:
The best-looking static text control height, in pixels. This value should be used to create static text controls that look optimal.

Uses win argument:
no

GetValue returns:
check box height

SetValue effect:
invalid

ATTR_CTL_VERT_SBAR_WIDTH

Description:
The best-looking vertical scrollbar thickness, in pixels. This value is the same as the thickness of vertical scrollbars that are created by specifying WSF_VSCROLL when creating a window.

Uses win argument:
no

GetValue returns:
scrollbar thickness

SetValue effect:
invalid

ATTR_DBLFRAME_HEIGHT

Description:
The thickness in pixels of a horizontal border of a double-border window. This can be used to calculate what the outer size of a window will be given its client area.

Uses win argument:
no

GetValue returns:
border thickness in pixels

SetValue effect:
invalid

ATTR_DBLFRAME_WIDTH

Description:
The thickness in pixels of a vertical border of a double-border window. This can be used to calculate what the outer size of a window will be given its client area.

Uses win argument:
no

GetValue returns:
border thickness in pixels

SetValue effect:
invalid

ATTR_DEBUG_FILENAME

Description:
The name of the debugging output file used by XVT++.

Uses `win` argument:
no

`GetValue` returns:
a pointer to a static buffer containing the current debug filename, which is "DEBUG" by default

`SetValue` effect:
Passing a pointer to a string containing the new debug filename causes the next debug file open to open the newly installed filename.

`ATTR_DOCFRAME_HEIGHT`

Description:
The thickness in pixels of a horizontal border of a resizable window. This can be used to calculate what the outer size of a window will be given its client area.

Uses `win` argument:
no

`GetValue` returns:
border thickness in pixels

`SetValue` effect:
invalid

`ATTR_DOCFRAME_WIDTH`

Description:
The thickness in pixels of a vertical border of a resizable window. This can be used to calculate what the outer size of a window will be given its client area.

Uses `win` argument:
no

`GetValue` returns:
border thickness in pixels

`SetValue` effect:
invalid

`ATTR_DOC_STAGGER_HORZ`

Description:
Recommended horizontal document window cascading offset.

Uses `win` argument:
no

GetValue returns:
offset in pixels

SetValue effect:
invalid

ATTR_DOC_STAGGER_VERT

Description:
Recommended vertical document window cascading offset.

Uses win argument:
no

GetValue returns:
offset in pixels

SetValue effect:
invalid

ATTR_EVENT_HOOK

Description:
A pointer to an event-handling function for native events. The prototype of this function varies between platforms, as do the nature of events sent to it. However, all event hook functions set with this attribute have the same return value. Namely, they return TRUE if XVT++ should perform its normal processing of the native event, and FALSE if XVT++ should not process the event.

Uses win argument:
no

GetValue returns:
the currently installed event hook function

SetValue effect:
Sets the event hook function. Setting this to NULL is valid, and means that there is no event hook installed.

See also:
platform-specific books

ATTR_FATAL_ERR_HANDLER

Description:
A pointer to an error-handling function that will be called at the very beginning of the Fatal function's processing. This is to allow your application to perform fatal-error-specific cleanup in one place. This is especially useful for fatal errors that are

generated internally to XVT++. This function must return. The fatal error handler function prototype is:

```
void (*FATAL_ERR_FUNC)();
```

Uses `win` argument:
no

`GetValue` returns:
current fatal error handler pointer

`SetValue` effect:
Sets fatal error handler function pointer. Setting to `NULL` means that there is no error handler.

`ATTR_FRAME_HEIGHT`

Description:
The thickness in pixels of a horizontal border of a non-resizable window. This can be used to calculate what the outer size of a window will be given its client area.

Uses `win` argument:
no

`GetValue` returns:
border thickness in pixels

`SetValue` effect:
invalid

`ATTR_FRAME_WIDTH`

Description:
The thickness in pixels of a vertical border of a non-resizable window. This can be used to calculate what the outer size of a window will be given its client area.

Uses `win` argument:
no

`GetValue` returns:
border thickness in pixels

`SetValue` effect:
invalid

`ATTR_HAVE_COLOR`

Description:
A `BOOLEAN` value indicating if the program is running on a color system.

Uses win argument:
no

GetValue returns:
TRUE if the system is color

SetValue effect:
invalid

ATTR_HAVE_MOUSE

Description:
A BOOLEAN value indicating if the program is running on a system with a mouse or other pointing device present.

Uses win argument:
no

GetValue returns:
TRUE if the system has a pointing device

SetValue effect:
invalid

ATTR_ICON_HEIGHT

Description:
The default icon height. This can be used to determine how much space will be used by DrawIcon. However, it is possible to create variable-size icons on some platforms, so this value has limited usefulness.

Uses win argument:
no

GetValue returns:
icon height

SetValue effect:
invalid

ATTR_ICON_WIDTH

Description:
The default icon width. This can be used to determine how much space will be used by DrawIcon. However, it is possible to create variable-size icons on some platforms, so this value has limited usefulness.

Uses win argument:
no

GetValue returns:
icon width

SetValue effect:
invalid

ATTR_KEY_HOOK

Description:
A pointer to an event-handling function for native keystroke events. The prototype of this function varies between platforms, as do the nature of events sent to it. However, all key hook functions set with this attribute have the same return value. Namely, they return FALSE if XVT++ should perform its normal key translation, and TRUE if XVT++ should accept the key translation performed by the hook function. This allows the application to supplement XVT++'s internal key translation algorithm.

Uses win argument:
no

GetValue returns:
the currently installed key hook function

SetValue effect:
Sets the key hook function. Setting this to NULL is valid, and means that there is no key hook installed.

See also:
platform-specific books

ATTR_MALLOC_ERR_HANDLER

Description:
A pointer to an error-handling function that is called when the XVT++ memory allocation functions xvt_malloc and xvt_realloc run out of memory. The function has the following prototype:

```
BOOLEAN (*MEM_ERR_FUNC)(size_t size);
```

Where size is the amount of memory needed. If you install a malloc error handler, then it should return TRUE if it is somehow able to make more memory available (such as by freeing a pre-allocated block), or FALSE otherwise.

Uses win argument:
no

GetValue returns:
current malloc error handler pointer

SetValue effect:
Sets malloc error handler function pointer. Setting to NULL means that there is no error handler.

See also:
The "Memory Allocation" chapter in the *XVT Guide,* for use of this attribute.

ATTR_MENU_HEIGHT

Description:
The height of a menubar. This can be used to calculate what the outer size of a window will be given its client area. However, it is up to the application to determine whether a particular window has a menu attached to it.

Uses win argument:
no

GetValue returns:
menu height in pixels

SetValue effect:
invalid

ATTR_NATIVE_GRAPHIC_CONTEXT

Description:
This value represents the underlying graphical context used by the native window system, for a particular window. While this is a "portable" attribute, it has a non-portable return value. For Windows, this returns an HDC. For PM, this returns an HPS. For Mac, this returns a Grafport. For X platforms (XM and XOL), this returns a GC. However, we do not recommend using this GC, as it has undocumented side-effects, and GCs are easy to create yourself.

Uses win argument:
yes

GetValue returns:
native context (requires casting)

SetValue effect:
invalid

See also:
platform-specific books

ATTR_NATIVE_WINDOW

Description:
This value represents the underlying window object used by the native window system, for a particular window. While this is a "portable" attribute, it has a non-portable return value. For Windows and PM, this returns an HWND. For Mac, this returns a Windowptr. For XM and XOL, this returns a Window.

Uses win argument:
yes

GetValue returns:
native graphical window (requires casting)

SetValue effect:
invalid

See also:
platform-specific books

ATTR_NUM_TIMERS

Description:
The number of timers in the system available to the application via XVT_Timer objects.

Uses win argument:
no

GetValue returns:
number of available timers

SetValue effect:
invalid

ATTR_PRINTER_HEIGHT

Description:
The height of the default printer, in pixels.

Uses win argument:
no

GetValue returns:
printer height

SetValue effect:
invalid

See also:
XVT_ESC_GET_PRINTER_INFO in the *XVT/Mac* and *XVT/PM* platform-specific books

ATTR_PRINTER_HRES

Description:
The horizontal resolution of the default printer, in pixels per inch.

Uses win argument:
no

GetValue returns:
printer horizontal resolution

SetValue effect:
invalid

See also:
XVT_ESC_GET_PRINTER_INFO in the *XVT/Mac* and *XVT/PM* platform-specific books

ATTR_PRINTER_WIDTH

Description:
The width of the default printer, in pixels.

Uses win argument:
no

GetValue returns:
printer width

SetValue effect:
invalid

See also:
XVT_ESC_GET_PRINTER_INFO in the *XVT/Mac* and *XVT/PM* platform-specific books

ATTR_PRINTER_VRES

Description:
The vertical resolution of the default printer, in pixels per inch.

Uses win argument:
no

GetValue returns:
printer vertical resolution

SetValue effect:
invalid

See also:
XVT_ESC_GET_PRINTER_INFO in the *XVT/Mac* and *XVT/PM* platform-specific books

Note: ATTR_PRINTER_* only return values appropriate for the default printer settings. To retrieve printer metrics for a printer setting stored in a PRINT_RCD, see the non-portable XVT_ESC_GET_PRINTER_INFO found in the platform-specific books.

ATTR_SCREEN_HEIGHT

Description:
The height of the screen, in pixels.

Uses win argument:
no

GetValue returns:
screen height

SetValue effect:
invalid

ATTR_SCREEN_HRES

Description:
The horizontal resolution of the screen, in pixels per inch.

Uses win argument:
no

GetValue returns:
screen horizontal resolution

SetValue effect:
invalid

ATTR_SCREEN_VRES

Description:
The vertical resolution of the screen, in pixels per inch.

Uses win argument:
no

GetValue returns:
screen vertical resolution

SetValue effect:
invalid

ATTR_SCREEN_WIDTH

Description:
The width of the screen, in pixels.

Uses win argument:
no

GetValue returns:
screen width

SetValue effect:
invalid

See also:
The *Guide*

ATTR_SUPPRESS_UPDATE_CHECK

Description:
A BOOLEAN value that controls XVT++'s policing of invalid function calls during calls to e_update. Normally, XVT++ disallows many function calls during an e_update, because they confuse the native window systems and are poor programming practice. However, if your application runs into an obscure case requiring this check to be disabled, then you can set this attribute to TRUE.

Uses win argument:
no

GetValue returns:
TRUE if update checking is disabled

SetValue effect:
Disables update checking if TRUE. Enables update checking if FALSE.

ATTR_TITLE_HEIGHT

Description:
The height of a window's title. This can be used to calculate what the outer size of a window will be given its client area. However, it is up to the application to determine whether a particular window has a title attached to it.

Uses win argument:
no

GetValue returns:
menu height in pixels

SetValue effect:
invalid

Equivalent C Function

set_value()

XVT_GlobalAPI::SetFileType

SET A FILE'S TYPE AND CREATOR

Prototypes

```
void
SetFileType(
        XVT_FileSpec*           file_spec,
        const char*             creator )
```

Parameters

`file_spec`
The file whose type and creator are to be set.

`creator`
A null terminated string specifying the creator. This string should be no longer than 4 alphanumeric characters.

Description

Set a file's type and creator if these are specified separately from a file's name.

Implementation Notes

XVT/Mac
This is the only platform on which this function is not a no-op. On all other platforms, the file type is just part of the file name, and the concept of creator doesn't exist.

XVT_GlobalAPI::StartupDir

RETURN TO THE APPLICATION'S STARTUP DIRECTORY

Prototypes

```
void
StartupDir()
```

Description

Returns to the application's startup directory.

Equivalent C Function

`startup_dir()`

XVT_GlobalAPI::TranslatePoints

TRANSLATE POINTS RELATIVE TO CONTAINERS

Prototypes

```
void
TranslatePoints(
        XVT_Container*          from,
        XVT_Container*          to,
        XVT_Pnt*                points,
        long                    count )
```

Parameters

`from`
The container to whose coordinate system the points are currently relative.

`to`
The container whose coordinate system the points should be translated into.

`points`
The array of points to be translated.

`count`
The number of points in points.

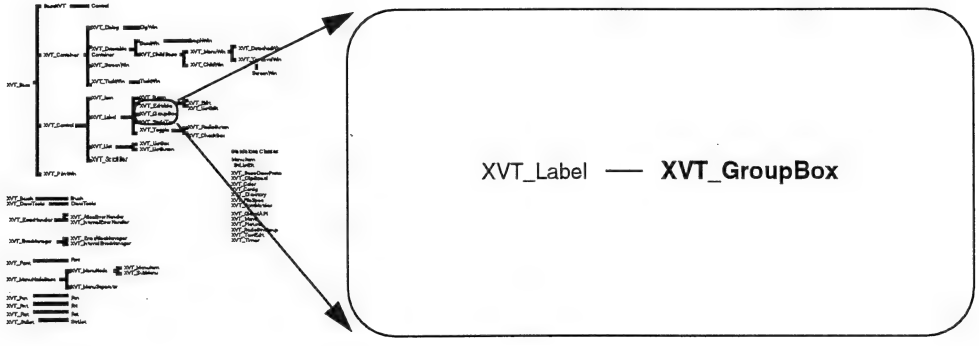
Description

Translates points from one container coordinate system to another.

Equivalent C Function

`translate_points()`

XVT_GroupBox



Overview

Header File	`groupbox.h`
Source File	
Superclass	`XVT_Label`
Subclasses	
Usage	Concrete

This class defines the interface to group box controls. As there are no virtual event handling member functions you do not need to subclass `XVT_GroupBox` to get a working control; just instantiate the class directly.

XVT++ group box controls provide a way to draw an annotated rectangle around (and behind) a group of controls in a window or dialog. The group box rectangle has an embedded label or title, which appears on the upper line of the rectangle, and may be either left, centered, or right depending on the text justification flags for the control.

A group box defines those controls that are within its boundaries as a set. This does not imply that a group box is the parent of controls contained within it; no such relationship exists. Group boxes are like

static text in that they provide no interaction capability or subsequent events; they are for annotation purposes only.

Group boxes are automatically placed to the back of a dialog or window by XVT++, behind all other controls. The behavior of overlapping group boxes is undefined.

Constructors

```
XVT_GroupBox( XVT_Dialog* parent, long cid )
XVT_GroupBox( XVT_DrawableContainer* parent, long cid )
```

Inherited Member Functions

From XVT_Label

page 239 `void GetTitle( char* str, unsigned long* len )`

page 239 `virtual BOOLEAN Init( XVT_Rct boundary, long = 0L, char * = NULL )`

page 240 `void SetTitle( char* str )`

From XVT_Control

page 92 `virtual void Close()`

page 93 `virtual void e_create()`

page 93 `virtual void e_destroy()`

page 94 `virtual long e_user( long id, void *data )`

page 95 `BOOLEAN GetEnabledState()`

page 95 `long GetID( void )`

page 95 `XVT_Base *GetParent( void )`

page 96 `BOOLEAN GetVisibleState()`

page 96 `void Init()`

page 96 `void MakeFront()`

page 97 `void SetEnabledState( BOOLEAN state )`

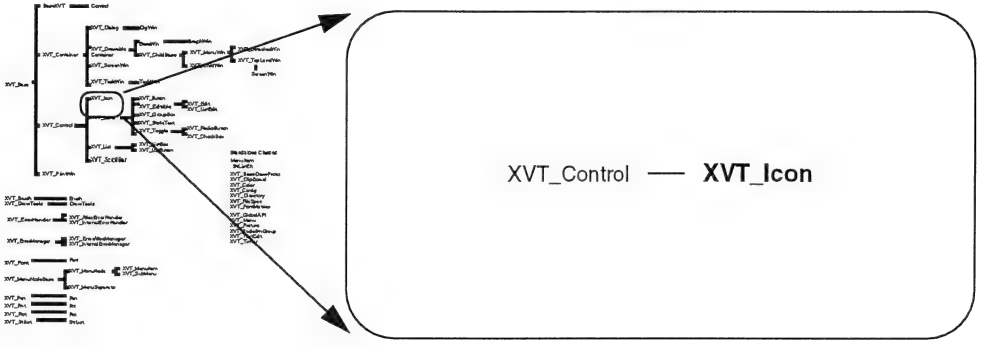
page 98 `void SetInnerRect( XVT_Rct boundary )`

page 98 `void SetVisibleState( BOOLEAN state )`

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_Icon



Overview

Header File	`icon.h`
Source File	`icon.cc`
Superclass	`XVT_Control`
Subclasses	
Usage	Concrete

This class defines the interface to icons. Since icons do not receive any events, there is no need to subclass `XVT_Icon` to produce a working icon. Just instantiate it directly.

XVT++ icon controls allow you to display platform-specific icons in dialogs and windows. The actual description (or resource definition) of an icon is handled differently for each XVT++ platform (see the platform-specific books for details.) However, once icons are described, XVT++ can portably handle their inclusion into windows and dialogs.

Constructors

```
XVT_Icon( XVT_Dialog* parent, long cid )
XVT_Icon( XVT_DrawableContainer* parent, long cid )
```

Member Functions

XVT_Icon::Init

INITIALIZE AN ICON

Prototypes

```
virtual BOOLEAN
Init()

virtual BOOLEAN
Init(
        XVT_Rct             boundary,
        long                cid = 0L,
        long                flags = 0L )
```

Parameters

`boundary`
The extent (outer boundary) of the icon.

`cid`
The icon's resource ID.

`flags`
A bitwise OR'd combination of control attribute flags.

Return Value

`TRUE` if the control was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by controls. Recovery can be attempted by disposing of the new control, closing another control, and retrying the creation of the control.

Description

Create the native icon if it does not already exist. If the icon is in a window or dialog that was created from resources, the underlying icon will already exist and the `XVT_Control::Init` member function should be used instead.

Equivalent C Function

create_control()

create_def_control()

Implementation Members

virtual BOOLEAN Init(XVT_IconEntry* icon_def)

Inherited Member Functions

From XVT_Control

page 92 virtual void Close()

page 93 virtual void e_create()

page 93 virtual void e_destroy()

page 94 virtual long e_user(long id, void *data)

page 95 BOOLEAN GetEnabledState()

page 95 long GetID(void)

page 95 XVT_Base *GetParent(void)

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

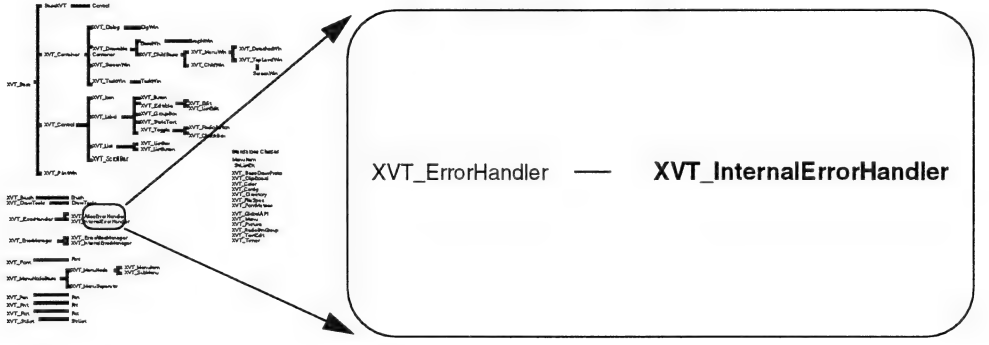
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

XVT_InternalErrorHandler



Overview

Header File	`error.h`
Source File	`error.cc`
Superclass	`XVT_ErrorHandler`
Subclasses	
Usage	Abstract

This class defines the interface to all internal error handlers. To create your own internal error handler, you would create a subclass that provides an implementation of `Handler`, which does whatever it needs to.

Example

Suppose that you were working with a database that your application had to lock and unlock. Even if an internal error occurred, it would be nice if your application released any locks it was holding before

exiting so that you would not have to do this by hand. The following subclass achieves this goal:

```
class MyInternalErrorHandler : public
XVT_InternalErrorHandler
{
    BOOLEAN Handler(
            char*file,
            char*version,
            longline,
            char*msg );
}

BOOLEAN
MyInternalErrorHandler::Handler(
        char* file,
        char* version,
        long line,
        char* msg )
{
    // Release any locks here

    return FALSE;
}
```

Constructors

```
XVT_InternalErrorHandler()
```

Member Functions

XVT_InternalErrorHandler::Handler

HANDLE AN INTERNAL ERROR

Prototypes

```
protected:

virtual BOOLEAN
Handler(
        const char*          file,
        const char*          version,
        long                 line,
        const char*          msg )
```

Parameters

`file`
The file in which the error occurred.

`version`
A string identifying the version of the file in which the error occurred.

`line`
The line number where the error occurred.

`msg`
A message describing the error.

Return Value

`TRUE` if the handler resolved the error condition and program execution can continue, `FALSE` if the next handler in the chain should be tried.

Since it is not possible to recover from an internal error, `Handle` ignores the value returned from `Handler` and always returns `FALSE`.

Description

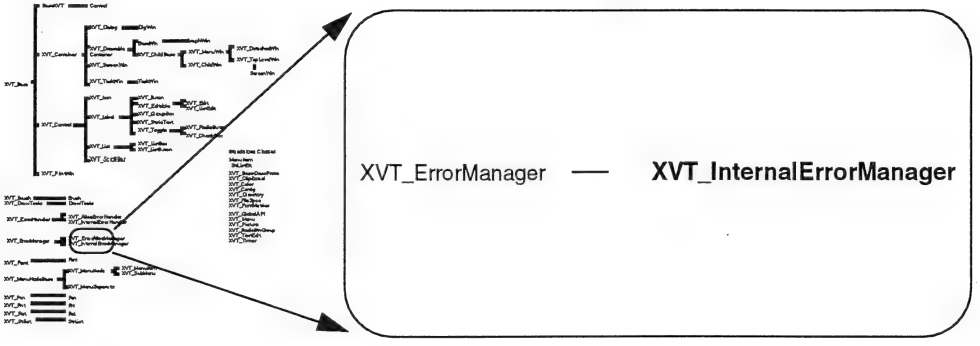
This function is called by `Handle` when this error handler is given a chance to handle an internal error.

Inherited Member Functions

From XVT_ErrorHandler

page 167 `virtual BOOLEAN Handle( long data )`

XVT_InternalErrorManager



Overview

Header File	`error.h`
Source File	`error.cc`
Superclass	`XVT_ErrorManager`
Subclasses	
Usage	Concrete

Instances of this class handle XVT++ internal errors. These errors arise when assertions inside XVT++ fail. They indicate a problem in the usage of XVT++.

There is only one instance of this class, pointed to by the global variable `XVT_InternalError`.

Constructors

`XVT_InternalErrorManager()`

Member Functions

XVT_InternalErrorManager::Raise

RAISE AN XVT++ INTERNAL ERROR

Prototypes

```
void
Raise(
        const char*         file,
        const char*         version,
        long                line,
        const char*         msg )
```

Parameters

`file`
The file in which the error occurred.

`version`
The RCS version of the file in which the error occurred.

`line`
The line number where the error occurred.

`msg`
A message describing the error.

Description

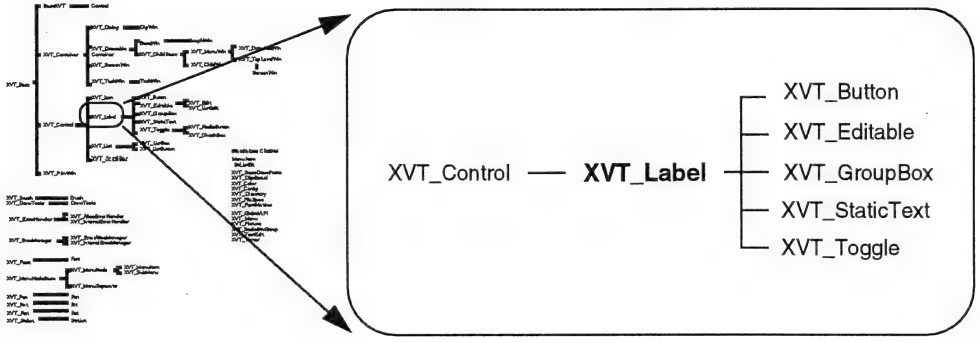
Signals an internal error. This function is always called through the macro `XVT_INTERNAL_ERROR`, which takes `msg` as a parameter and supplies the other three parameters.

Inherited Member Functions

From XVT_ErrorManager

page 170 `virtual void Raise( long data )`

XVT_Label



Overview

Header File	`label.h`
Source File	`label.cc`
Superclass	`XVT_Control`
Subclasses	`XVT_Button, XVT_Editable, XVT_GroupBox, XVT_StaticText, XVT_Toggle`
Usage	Implementation

The `XVT_Label` class defines the interface common to all controls that have settable titles.

Member Functions

XVT_Label::GetTitle

RETRIEVE A CONTROL'S TITLE

Prototypes

```
BOOLEAN
GetTitle(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the control's title.

`len`
A pointer to the length of buffer.

Return Value

TRUE if the length of `buffer` was sufficient to hold the application's name, FALSE if not. If FALSE is returned, `len` is set to the required length.

Equivalent C Function

```
get_title()
```

XVT_Label::Init

INITIALIZE A LABEL

Prototypes

```
BOOLEAN
Init()

BOOLEAN
Init(
        XVT_Rct                 boundary,
        long                    flags = 0L,
        const char*             title = NULL )
```

Parameters

`boundary`
The bounding rectangle for the control. If the height of the bounding rectangle is zero, the default height of the native system is used.

`flags`
Attribute flags.

`title`
The control's initial title.

Return Value

`TRUE` if the control was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by controls. Recovery may be attempted by disposing of the new control, closing another control, and retrying the creation of the control.

Description

Creates the native control if it does not already exist. If the control is in a window or dialog that was created from resources, the underlying control already exists and the `XVT_Control::Init` member function should be used instead.

Equivalent C Function

`create_control()`

`create_def_control()`

XVT_Label::SetTitle

SETA CONTROL'S TITLE

Prototypes

```
void
SetTitle(
        const char*             str )
```

Parameters

`str`
The new title.

Description

Sets the control's title to the title passed in `str`.

Equivalent C Function

set_title()

Implementation Members

virtual BOOLEAN Init(XVT_ControlEntry* def)
TitleProtocol

Inherited Member Functions

From XVT_Control

page 92 virtual void Close()
page 93 virtual void e_create()
page 93 virtual void e_destroy()
page 94 virtual long e_user(long id, void *data)
page 95 BOOLEAN GetEnabledState()
page 95 long GetID(void)
page 95 XVT_Base *GetParent(void)
page 96 BOOLEAN GetVisibleState()
page 96 void Init()
page 96 void MakeFront()
page 97 void SetEnabledState(BOOLEAN state)
page 98 void SetInnerRect(XVT_Rct boundary)
page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

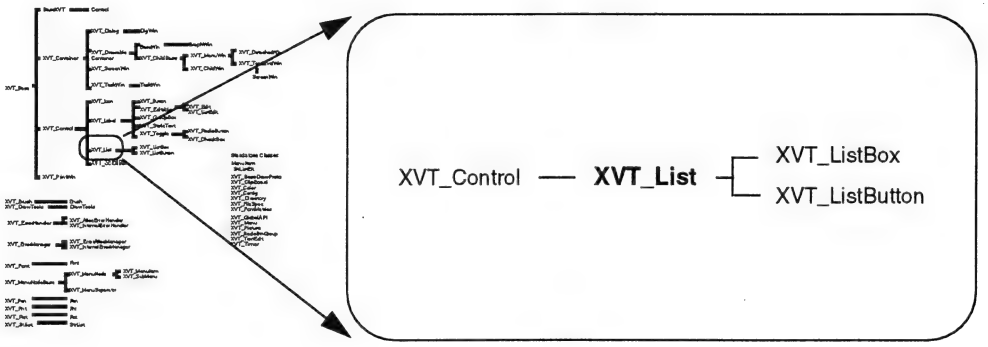
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

XVT_List



Overview

Header File	`list.h`
Source File	`list.cc`
Superclass	`XVT_Control`
Subclasses	`XVT_ListBox`, `XVT_ListButton`
Usage	Implementation

The `XVT_List` class defines the interface common to all objects that have list components.

Member Functions

XVT_List::Add

ADD AN ITEM OR ITEMS TO A LIST

Prototypes

```
BOOLEAN
Add(
        long                    index,
        const char*             str )

BOOLEAN
Add(
        const char*             str )

BOOLEAN
Add(
        long                    index
        XVT_StrList*            list )

BOOLEAN
Add(
        XVT_StrList*            list )
```

Parameters

`index`
The index of the item before which to add the new item or items. An index that is too large or -1 causes items to be added to the end of the list.

`str`
The text of the item to add.

`list`
The list of items to add.

Description

`Add( index, str )`
Add a string to the list control at the location given by index.

`Add( str )`
Add a string to the end of the list control.

`Add( index, list )`
Add a list of strings to the list control at the location given by index.

`Add( list )`
Add a list of strings to the end of the list control.

Equivalent C Function

```
win_list_add
```

XVT_List::Clear

REMOVE ALL ITEMS FROM THE LIST

Prototypes

```
BOOLEAN
Clear()
```

Return Value

TRUE if successful, FALSE if not.

Description

Removes all items from the list.

Equivalent C Function

```
win_list_clear()
```

XVT_List::CountAll

RETRIEVE THE NUMBER OF ITEMS IN A LIST

Prototypes

```
long
CountAll() const
```

Return Value

The number of items in the list.

Equivalent C Function

```
win_list_count_all()
```

XVT_List::CountSelections

RETRIEVE THE NUMBER OF SELECTED ITEMS

Prototypes

```
long
CountSelections()
```

Return Value

The number of selected items in the list. For single select list boxes this is always either 1 or 0.

Equivalent C Function

```
win_list_count_sel()
```

XVT_List::Delete

REMOVE AN ITEM FROM A LIST CONTROL

Prototypes

```
BOOLEAN
Delete(
        long                    index )
```

Parameters

`index`
The index of the item to delete.

Return Value

`TRUE` if successful, `FALSE` if not.

Description

Deletes an item from a list control.

Equivalent C Function

```
win_list_delete()
```

XVT_List::GetAll

RETRIEVE ALL ITEMS FROM A LIST CONTROL

Prototypes

```
XVT_StrList
GetAll() const
```

Return Value

A list of all items in the list control.

Equivalent C Function

```
win_list_get_all()
```

XVT_List::GetElement

RETRIEVE AN ITEM IN A LIST CONTROL

Prototypes

```
BOOLEAN
GetElement(
        long                    index,
        char*                   buffer,
        unsigned long*          len )
```

XVT_List::Parameters

`index`
The index of the item to get.

`buffer`
Storage to receive the item.

`len`
A pointer to the length of `buffer`.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the selected item, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

Equivalent C Function

```
win_list_get_elt()
```

XVT_List::GetFirstSelection

RETRIEVE THE FIRST SELECTED ITEM IN A LIST BOX

Prototypes

```
BOOLEAN
GetFirstSelection(
        char*                   buffer
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage to receive the selected item. If no items were selected, the empty string, "", will be returned. Since empty strings can be inserted into list boxes, you should always use `CountSelections` to determine if there are selected items.

`len`
A pointer to the length of `buffer`.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the selected item, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

Equivalent C Function

```
win_list_get_first_sel()
```

XVT_List::GetSelectedState

DETERMINE IF AN ITEM IS SELECTED

Prototypes

```
BOOLEAN
GetSelectedState(
        long                    index ) const
```

Parameters

`index`
The index of the item to check for selectedness.

Return Value

A flag that is `TRUE` if the item is selected, `FALSE` if unselected.

Equivalent C Function

```
win_list_is_sel()
```

XVT_List::GetSelectionIndex

RETRIEVE THE INDEX OF THE FIRST SELECTED ITEM

Prototypes

```
long
GetSelectionIndex() const
```

Return Value

The index of the first selected item in the control.

Equivalent C Function

```
win_list_get_sel_index()
```

XVT_List::GetSelections

RETRIEVE ALL SELECTED ITEMS

Prototypes

```
XVT_StrList
GetSelections() const
```

Return Value

A string list of all selected items. The order of items in the list is the same as the order of items in the control. The data word in the list is an index to the corresponding item in the control.

Equivalent C Function

```
win_list_get_sel()
```

XVT_List::Init

INITIALIZE A LIST

Prototypes

```
virtual BOOLEAN
Init(
        XVT_Rct             boundary,
        long                flags = 0L,
        const char*         title = NULL )
```

Parameters

`boundary`
The bounding rectangle for the control. If the height of the rectangle is zero, the default height of the native system is used.

`flags`
Attribute flags

`title`
The list's title.

Return Value

`TRUE` if the control was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by controls. Recovery may be attempted by disposing of the new control, closing another control, and retrying the creation of the control.

Description

Create the native control if it does not already exist. If the control is in a window or dialog that was created from resources, the underlying control already exists and the `XVT_Control::Init` member function should be used instead.

XVT_List::SetSelectedState

SELECT OR UNSELECT AN ITEM

Prototypes

```
void
SetSelectedState(
        long                index,
        BOOLEAN             select )
```

Parameters

`index`
The index of the item to check for selectedness.

`select`
A flag that is `TRUE` if the item is to be selected, `FALSE` if unselected.

Description

Selects or unselects an item.

Equivalent C Function

`win_list_set_sel()`

Implementation Members

```
XVT_List
~XVT_List
virtual BOOLEAN Init( XVT_ControlEntry* def )
ListEltProtocol
```

Inherited Member Functions

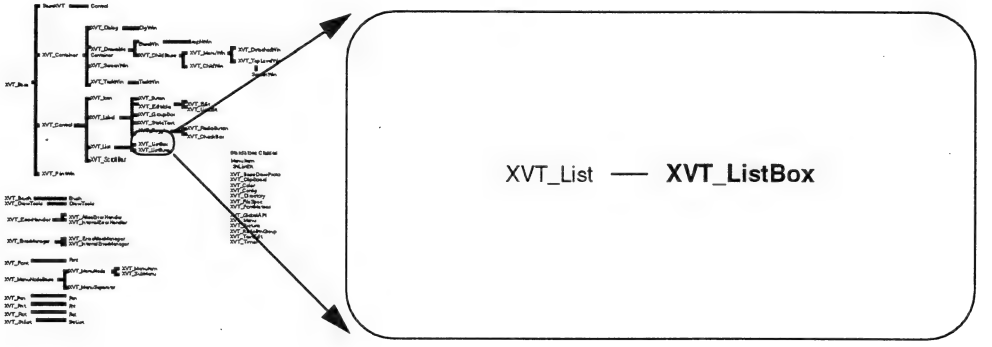
From XVT_Control

page 92 `virtual void Close()`
page 93 `virtual void e_create()`
page 93 `virtual void e_destroy()`
page 94 `virtual long e_user( long id, void *data )`
page 95 `BOOLEAN GetEnabledState()`
page 95 `long GetID( void )`
page 95 `XVT_Base *GetParent( void )`
page 96 `BOOLEAN GetVisibleState()`
page 96 `void Init()`
page 96 `void MakeFront()`
page 97 `void SetEnabledState( BOOLEAN state )`
page 98 `void SetInnerRect( XVT_Rct boundary )`
page 98 `void SetVisibleState( BOOLEAN state )`

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_ListBox



Overview

Header File	`listbox.h`
Source File	`listbox.cc`
Superclass	`XVT_List`
Subclasses	
Usage	Abstract

The `XVT_ListBox` class specifies the interface to list boxes.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

List boxes allow the user to make single or multiple selections from a scrollable list of candidate selections. List boxes generate calls to the `e_action` member function when the user single clicks or double clicks on an item in the list box. You will not receive any events in your application when the user scrolls the list box; this behavior is handled automatically by the native list box control.

Constructors

```
XVT_ListBox( XVT_Dialog *parent, long cid )
XVT_ListBox( XVT_DrawableContainer *parent, long cid )
virtual ~XVT_ListBox()
```

Member Functions

XVT_ListBox::e_action

RECEIVE NOTIFICATION OF LIST BOX ACTIVITY

Prototypes

```
virtual void
e_action(
        BOOLEAN                 dbl_click )
```

Parameters

`dbl_click`
A flag that is TRUE if the user double-clicked on a particular item.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to user manipulations of a list box.

XVT_ListBox::GetSuspendedState

DETERMINE IF UPDATES TO A LIST BOX ARE SUSPENDED

Prototypes

```
BOOLEAN
GetSuspendedState() const
```

Return Value

A flag that is TRUE if updates have been suspended, FALSE if not.

XVT_ListBox::SetSuspendedState

SUSPEND OR RESUME UPDATES TO A LIST BOX

Prototypes

```
void
SetSuspendedState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if updates are to be suspended, `FALSE` if they are to be resumed.

Description

Suspends or resumes updates to a list box.

As updating a list box can be quite costly, it is a good idea to suspend updates before a section of code that makes several modifications to a list box and resume updates after all of the modifications are completed.

Equivalent C Function

`win_list_suspend()`

`win_list_resume()`

Inherited Member Functions

From XVT_List

page 244 `BOOLEAN Add( long index, const char* str )`

page 244 `BOOLEAN Add( const char* str )`

page 244 `BOOLEAN Add( long index XVT_StrList* list )`

page 244 `BOOLEAN Add( XVT_StrList* list )`

page 245 `BOOLEAN Clear()`

page 245 `long CountAll()`

page 246 `long CountSelections()`

page 246 `BOOLEAN Delete( long index)`

page 247 `XVT_StrList GetAll()`

page 247 BOOLEAN GetElement(long index, char *buffer, unsigned long* len)

page 248 BOOLEAN GetFirstSelection(char* buffer, unsigned long* len)

page 248 BOOLEAN GetSelectedState(long)

page 249 long GetSelectionIndex()

page 249 XVT_StrList GetSelections()

page 250 virtual BOOLEAN Init(XVT_Rct boundary, long flags = 0L, const char* title = NULL)

page 250 void SetSelectedState(long, BOOLEAN)

From XVT_Control

page 92 virtual void Close()

page 93 virtual void e_create()

page 93 virtual void e_destroy()

page 94 virtual long e_user(long id, void *data)

page 95 BOOLEAN GetEnabledState()

page 95 long GetID(void)

page 95 XVT_Base *GetParent(void)

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

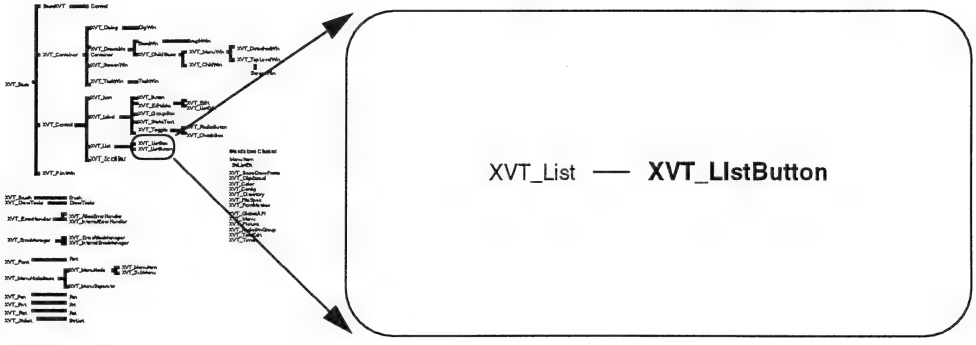
page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_ListButton



Overview

Header File	`listbtn.h`
Source File	`listbtn.cc`
Superclass	`XVT_List`
Subclasses	
Usage	Abstract

The `XVT_ListButton` class specifies the interface to list buttons.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

An XVT list button control is a combination of two other control types: a push button and a selection list. (Such controls are sometimes referred to as "combo controls" for this reason.) A list button can be described as a list box that can be displayed in two ways:

- A push button whose text label represents the current selection in the list (when the control is not being used).
- A list box (when the control is being used).

The list box part of the list button is transitory—it appears only when the list button is pressed. When a selection is made from the list, the list box part of the control disappears, leaving the selected text in the list button. (If the list button list is empty, then the list button label will also be empty.)

The events that are generated from list buttons are similar to those generated from list boxes except that, because double clicks aren't supported in list buttons, the event is merely signalling that the user made a selection from the list.

Constructors

```
XVT_ListButton( XVT_Dialog* parent, long cid )
XVT_ListButton( XVT_DrawableContainer* parent, long cid )
```

Member Functions

XVT_ListButton::e_action

RECEIVE NOTICE OF USER MANIPULATION OF A LIST BUTTON

Prototypes

```
virtual void
e_action()
```

Description

Receives notice of user manipulation of a list button.

This member function must be overridden by a subclass if the application wishes to take any actions in response to user manipulations of a list button.

Inherited Member Functions

From XVT_List

page 244 BOOLEAN Add(long index, const char* str)

page 244 BOOLEAN Add(const char* str)

page 244 BOOLEAN Add(long index XVT_StrList* list)

page 244 BOOLEAN Add(XVT_StrList* list)

page 245 BOOLEAN Clear()

page 245 long CountAll()

page 246 long CountSelections()

page 246 BOOLEAN Delete(long index)

page 247 XVT_StrList GetAll()

page 247 BOOLEAN GetElement(long index, char *buffer, unsigned long* len)

page 248 BOOLEAN GetFirstSelection(char* buffer, unsigned long* len)

page 248 BOOLEAN GetSelectedState(long)

page 249 long GetSelectionIndex()

page 249 XVT_StrList GetSelections()

page 250 virtual BOOLEAN Init(XVT_Rct boundary, long flags = 0L, const char* title = NULL)

page 250 void SetSelectedState(long, BOOLEAN)

From XVT_Control

page 92 virtual void Close()

page 93 virtual void e_create()

page 93 virtual void e_destroy()

page 94 virtual long e_user(long id, void *data)

page 95 BOOLEAN GetEnabledState()

page 95 long GetID(void)

page 95 XVT_Base *GetParent(void)

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

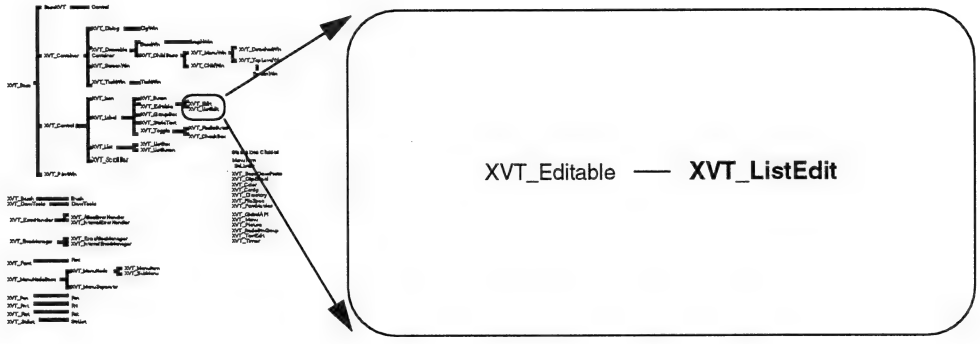
page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_ListEdit



Overview

Header File	`listedit.h`
Source File	`listedit.cc`
Superclass	`XVT_Editable`
Subclasses	
Usage	Abstract

This class defines the interface to list edit field controls.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Constructors

```
XVT_ListEdit( XVT_Dialog* parent, long cid )
XVT_ListEdit( XVT_DrawableContainer* parent, long cid )
virtual ~XVT_ListEdit()
```

Member Functions

The following functions work exactly as for XVT_List:

page 244 `BOOLEAN Add( long index XVT_StrList* list )`

page 245 `BOOLEAN Clear()`

page 245 `long CountAll()`

page 246 `BOOLEAN Delete( long index)`

page 247 `XVT_StrList GetAll()`

page 247 `BOOLEAN GetElement( long index, char *buffer, unsigned long* len )`

The following functions work exactly as for XVT_ListBox:

page 255 `void SetSuspendedState( BOOLEAN state )`

XVT_ListEdit::Add

ADD ITEMS TO A LIST

Prototypes

```
void
Add(
        long                    index,
        const char*             str )

void
Add(
        const char*             str )

void
Add(
        XVT_StrList*            list )
```

XVT_List::Parameters

`index`
The index of the item before which to add the new item or items. An index that is too large or –1 causes items to be added at the end of the list.

`str`
The text of the item to add.

`list`
The list of items to add.

Description

`Add( index, list )`
Adds a list of items to the list control.

`Add( index, str )`
Adds a single item to the list control.

Equivalent C Function

`win_list_add()`

Implementation Members

`ListEltProtocol`
`ListSuspendProtocol`

Inherited Member Functions

From XVT_Editable

page 161 `virtual void e_action()`

page 162 `e_focus( BOOLEANactive )`

page 163 `void SelectText( long first, long last )`

From XVT_Label

page 239 `void GetTitle( char* str, unsigned long* len )`

page 239 `virtual BOOLEAN Init( XVT_Rct boundary, long = 0L, char * = NULL )`

page 240 `void SetTitle( char* str )`

From XVT_Control

page 92 `virtual void Close()`

page 93 `virtual void e_create()`

page 93 `virtual void e_destroy()`

page 94 `virtual long e_user( long id, void *data )`

page 95 `BOOLEAN GetEnabledState()`

page 95 `long GetID( void )`

page 95 `XVT_Base *GetParent( void )`

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

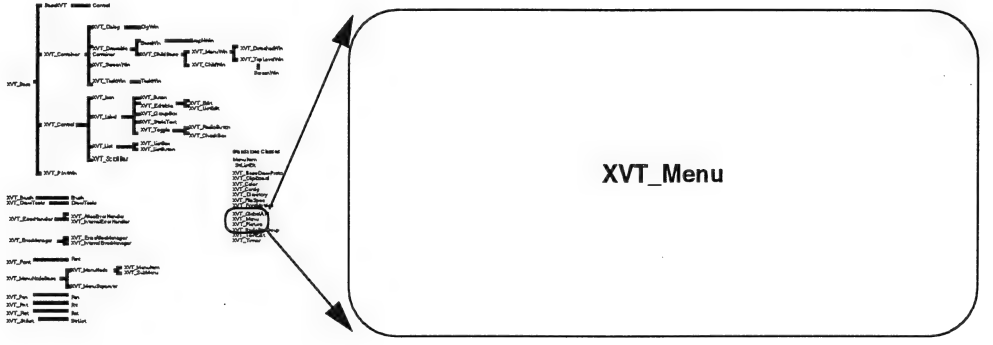
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

XVT_Menu



Overview

Header File	`menu.h`
Source File	`menu.cc`
Superclass	
Subclasses	
Usage	Concrete

A menu is a recursive structure used to specify the appearance and function of the menubar associated with a window. Conceptually, the menu consists of a list of nodes, each node specifying an item in the menu. Nodes can be separators, submenus or menu items. A submenu item points to another `XVT_Menu` structure. A menu item must be subclassed so as to override its virtual event handler member function with an implementation that actually does something when the item is selected by the user.

Menus can be constructed at runtime or from a resource description. To construct a menu at runtime, build from the bottom of the menu hierarchy to the top. Create the bottom-most sub-menu, install its items, then create its parent menu, install the submenu and any other items in it and so forth until you reach the top-level menu.

To construct a menu from resources, use the `XVT_Menu( rid )` constructor. It creates a complete menu hierarchy populated with default menu items. A default menu item raises an internal error when it is selected by the user. In order to make the menu usable, you must replace the default items with instances of your own menu subclasses by using the `Replace` member function.

Example

Let's consider loading a menu from resources as we do when we create the task window. First we create our task window subclass:

```
class MyTask : public XVT_TaskWin
{
    void e_create();
    void e_close();
        .
        .
        .
}
```

Then we create some menu item subclasses for the standard menu items in the file menu:

```
class MyFileOpenItem : public XVT_MenuItem
{
    MyFileOpenItem( MENU_TAG tag )
        : XVT_MenuItem( tag );
    void e_action( BOOLEAN shift, BOOLEAN control );
}

void
MyFileOpenItem::e_action( BOOLEAN shift, BOOLEAN control
)
{
    // Open a file...
}

class MyFileCloseItem : public XVT_MenuItem
{
    MyFileCloseItem ( MENU_TAG tag )
        : XVT_MenuItem( tag );
```

```
    void e_action( BOOLEAN shift, BOOLEAN control );
}

void
MyFileCloseItem::e_action(BOOLEANshift,BOOLEANcontrol
)
{
    // Close a file...
}
    .
    .
```

Next, when the task window is created, we replace the default items, which will raise an error if they are used, with our items which do whatever we want (presumably opening and closing files) when they are used.

```
void
MyTask::e_create()
{
    XVT_MenuItem* thisItem;

    thisItem = new MyFileOpenItem( M_FILE_OPEN );
    Menu->Replace( thisItem );
    thisItem = new MyFileCloseItem( M_FILE_CLOSE );
    Menu->Replace( thisItem );
    .
    .
    .
}
```

The standard file open and close menu items will now do whatever you have programmed into the corresponding `e_action` event handler methods.

Constructors

`XVT_Menu()`
: Create a menu at runtime. You will have to add menu items to the menu using the Install member function.

`XVT_Menu( long rid )`
: Create a menu from the given menu resource. You will need to replace the default menu items using the Replace member function.

`XVT_Menu( XVT_Menu& menu )`

`~XVT_Menu()`

Member Functions

XVT_Menu::GetCount

RETRIEVE THE NUMBER OF MENU ITEMS

Prototypes

```
long
GetCount() const
```

Return Value

The number of menu items in this menu.

XVT_Menu::GetFirst

RETRIEVE THE FIRST MENU ITEM

Prototypes

```
XVT_MenuNodeBase*
GetFirst()
```

Return Value

The first menu item or `NULL` if the menu contains no items.

Description

Retrieves the first menu item and sets up the traversal context such that subsequent calls to `GetNext` retrieve subsequent items.

XVT_Menu::GetItem

RETRIEVE THE ITEM WITH THE MATCHING TAG

Prototypes

```
XVT_MenuNode*
GetItem(
        MENU_TAG                tag )
```

Parameters

`tag`
The tag.

Return Value

The menu item whose tag is equal to `tag` or `NULL` if none was found.

XVT_Menu::GetNext

RETRIEVE SUBSEQUENT MENU ITEMS

Prototypes

```
XVT_MenuNodeBase*
GetNext()
```

Return Value

The next menu item or `NULL` if the end of the list of items has been reached.

Description

Retrieves subsequent menu items.

XVT_Menu::Install

INSTALL AN ITEM IN A MENU

Prototypes

```
void
Install(
        XVT_MenuNodeBase*       node )
```

Parameters

`node`
The node to be installed.

Description

Installs a menu item in a menu. Items appear in the menu in the order in which they were installed.

This function is used to construct menus at runtime. To create menus from resources, use `Replace`.

XVT_Menu::Replace

REPLACE THE DEFAULT MENU ITEM WITH THE SAME TAG

Prototypes

```
void
Replace(
        XVT_MenuItem*          item )
```

Parameters

`item`
The item to replace the default item.

Description

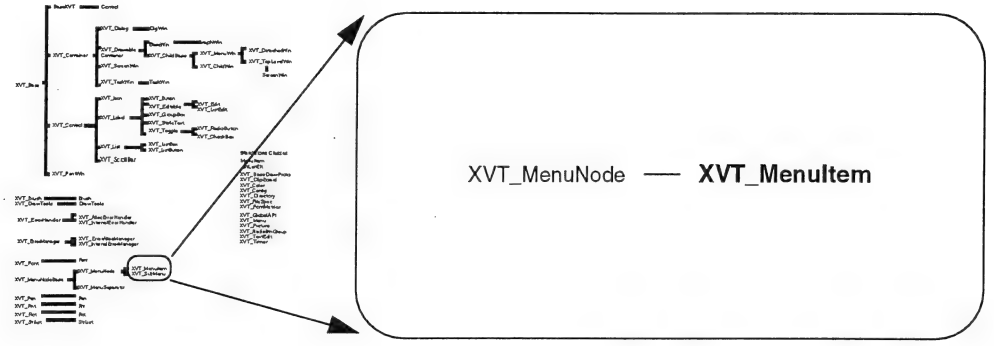
Replaces the default item with the tag matching that in `item`. Only default items can be replaced.

This function is used to construct menus from resources. To create menus at runtime, use `Install`.

Implementation Members

```
XVT_Menu( MENU_ITEM* mip )
GetOwner
SetOwner
ConvertTo
Owner
List
InitMenu
```

XVT_MenuItem



Overview

Header File	`menu.h`
Source File	`menu.cc`
Superclass	`XVT_MenuNode`
Subclasses	
Usage	Abstract

The `XVT_MenuItem` class specifies the interface to all menu items.

You use this class by creating a subclass that overrides the virtual event handling member function with an implementation that actually does something in response to menu selection.

Example

See the example in the description of `XVT_Menu`.

Constructors

```
XVT_MenuItem(
    MENU_TAG tag = 0
    BOOLEAN enabled = TRUE,
    BOOLEAN checked = FALSE,
    BOOLEAN checkable = FALSE,
    const char* text = NULL,
    short mkey = 0 )
XVT_MenuItem( const XVT_MenuItem& item )
~XVT_MenuItem()
```

Member Functions

XVT_MenuItem::e_action

RECEIVE NOTIFICATION OF MENU SELECTION

Prototypes

```
virtual
void e_action(
        BOOLEAN                 shift,
        BOOLEAN                 control )
```

Parameters

`shift`
A flag that is `TRUE` if the shift key was depressed when this item was selected, `FALSE` if not.

`control`
A flag that is `TRUE` if the control key was depressed when this item was selected, `FALSE` if not.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to the selection of this menu item.

XVT_MenuItem::GetCheckableState

DETERMINE IF A MENU ITEM IS CHECKABLE

Prototypes

```
BOOLEAN
GetCheckableState() const
```

Return Value

A flag that is TRUE if the menu item is checkable, FALSE if not.

XVT_MenuItem::GetCheckedState

DETERMINE IF A MENU ITEM IS CHECKED

Prototypes

```
BOOLEAN
GetCheckedState() const
```

Return Value

A flag that is TRUE if the menu item is checked, FALSE if not.

XVT_MenuItem::SetCheckedState

CHECK OR UNCHECK A MENU ITEM

Prototypes

```
void
SetCheckedState(
        BOOLEAN                 state )
```

Parameters

state
A flag that is TRUE if the menu item is to be checked, FALSE if it is to be unchecked.

Equivalent C Function

```
win_menu_check()
```

Implementation Members

```
XVT_MenuItem( MENU_ITEM* mip )
ConvertTo
CopyState
CheckProtocol
CheckedState
CheckableState
InitProtocols
KillProtocols
```

Inherited Member Functions

From XVT_MenuNode

page 278 BOOLEAN GetEnabledState()

page 278 short GetMKey()

page 278 void GetTitle(char *buffer, long len)

page 279 void SetEnabledState(BOOLEAN state)

page 279 void SetTitle(char *str)

From XVT_MenuNodeBase

page 281 virtual XVT_MenuItem *CastToMenuItem()

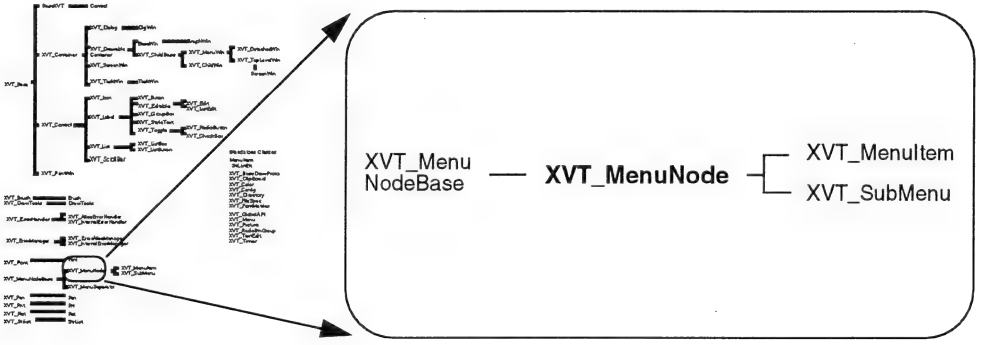
page 281 virtual XVT_MenuNode *CastToMenuNode()

page 281 virtual XVT_MenuSeparator *CastToMenuSeparator()

page 281 virtual XVT_SubMenu *CastToSubMenu()

page 282 XVT_Menu *GetParent()

XVT_MenuNode



Overview

Header File	`menu.h`
Source File	`menu.cc`
Superclass	`XVT_MenuNodeBase`
Subclasses	`XVT_MenuItem`, `XVT_SubMenu`
Usage	Implementation

This class defines the interface common to all menu items that have titles.

Member Functions

XVT_MenuNode::GetEnabledState

DETERMINE IF A MENU IS ENABLED OR DISABLED

Prototypes

```
BOOLEAN
GetEnabledState() const
```

Return Value

A flag that is TRUE if the menu is enabled, FALSE if it is disabled.

XVT_MenuNode::GetMKey

RETRIEVE THE MENU'S ACCELERATOR KEY

Prototypes

```
short
GetMKey() const
```

Return Value

The menu's accelerator key code.

XVT_MenuNode::GetTitle

RETRIEVE A MENU ITEM'S TITLE

Prototypes

```
BOOLEAN
GetTitle(
        char*                   buffer,
        unsigned long           len ) const
```

Parameters

`buffer`
Storage to receive the item's title.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the item's title, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

XVT_MenuNode::SetEnabledState

ENABLE OR DISABLE A MENU ITEM

Prototypes

```
void
SetEnabledState(
        BOOLEAN                 state )
```

Parameters

`state`
A flag that is `TRUE` if the menu is to be enabled, `FALSE` if it is to be disabled.

Description

Enables or disables a menu item.

Equivalent C Function

`win_menu_enable()`

XVT_MenuNode::SetTitle

SET A MENU ITEM'S TITLE

Prototypes

```
void
SetTitle(
        char*                   str )
```

Parameters

`str`
The new title.

Description

Sets a menu item's title.

Equivalent C Function

`win_set_menu_text()`

Implementation Members

```
XVT_MenuNode( MENU_ITEM* mip )
ConvertTo
SetOwner
GetTag
EnableProtocol
TitleProtocol
MKey
Title
Tag
EnabledState
KillProtocols
InitProtocols
```

Inherited Member Functions

From XVT_MenuNodeBase

page 281 `virtual XVT_MenuItem *CastToMenuItem()`

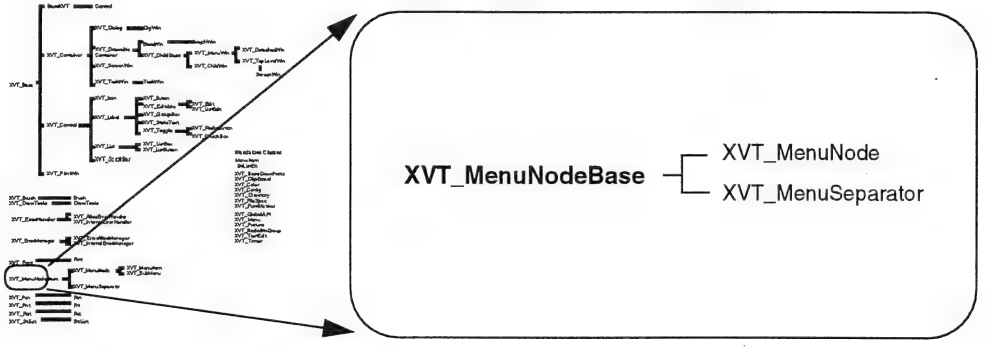
page 281 `virtual XVT_MenuNode *CastToMenuNode()`

page 281 `virtual XVT_MenuSeparator *CastToMenuSeparator()`

page 281 `virtual XVT_SubMenu *CastToSubMenu()`

page 282 `XVT_Menu *GetParent()`

XVT_MenuNodeBase



Overview

Header File	`menu.h`
Source File	`menu.cc`
Superclass	
Subclasses	`XVT_MenuNode`, `XVT_MenuSeparator`
Usage	Implementation

This class defines the interface common to all menu nodes (items).

Casts

Virtual cast functions are provided to allow type-safe downcasting. The default implementation of each cast function is to return `NULL`. Each subclass overrides the corresponding cast function to return a pointer to `this` instead.

```
virtual XVT_MenuItem* CastToMenuItem()
virtual XVT_MenuSeparator* CastToMenuSeparator()
virtual XVT_SubMenu* CastToSubMenu()
virtual XVT_MenuNode* CastToMenuNode()
virtual XVT_DefaultMenuItem* CastToDefaultMenuItem()
```

Member Functions

XVT_MenuNodeBase::GetParent

RETRIEVE THE PARENT MENU OF THIS ITEM

Prototypes

```
XVT_Menu*
GetParent() const
```

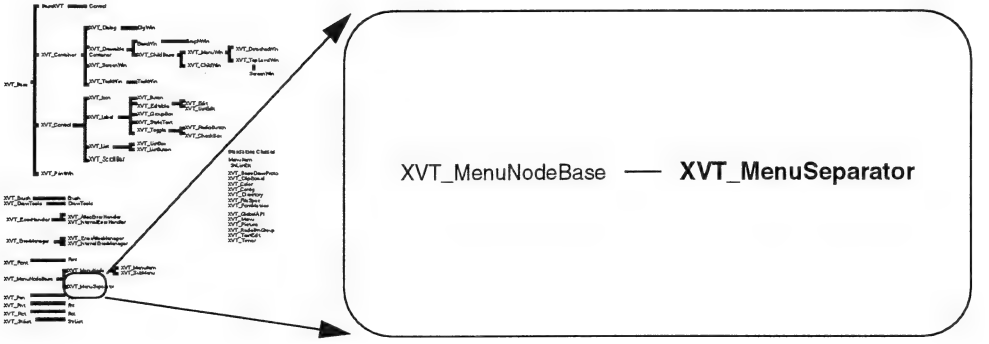
Return Value

The parent menu of this item, or `NULL` if this item is not part of a sub-menu.

Implementation Members

```
ConvertTo
SetOwner
GetOwner
Owner
SetParent
Parent
NotPortableInfo
DeleteNPInfo
WriteNPInfo
WriteNPInfo
ReadNPInfo
CopyNPInfo
```

XVT_MenuSeparator



Overview

Header File	menu.h
Source File	menu.cc
Superclass	XVT_MenuNodeBase
Subclasses	
Usage	Concrete

Instances of this class represent menu separators.

Constructors

```
XVT_MenuSeparator()
~XVT_MenuSeparator()
```

Implementation Members

```
XVT_MenuSeparator( MENU_ITEM* mip )
ConvertTo
```

Inherited Member Functions

From XVT_MenuNodeBase

page 281 `virtual XVT_MenuItem *CastToMenuItem()`

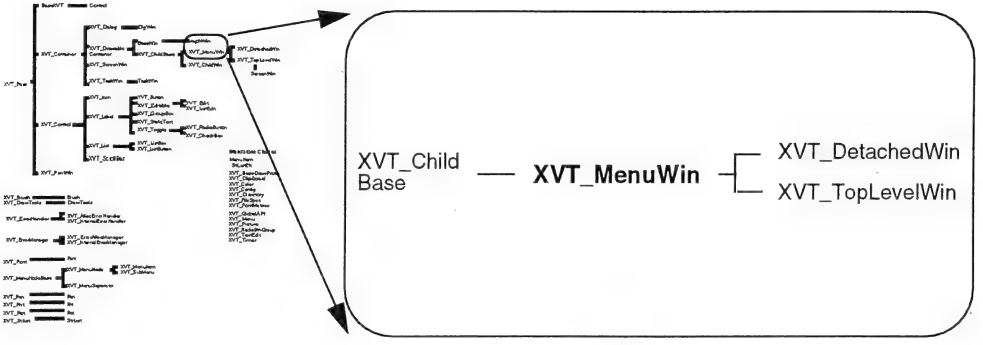
page 281 `virtual XVT_MenuNode *CastToMenuNode()`

page 281 `virtual XVT_MenuSeparator *CastToMenuSeparator()`

page 281 `virtual XVT_SubMenu *CastToSubMenu()`

page 282 `XVT_Menu *GetParent()`

XVT_MenuWin



Overview

Header File	`menuwin.h`
Source File	`menuwin.cc`
Superclass	`XVT_ChildBase`
Subclasses	`XVT_DetachedWin`, `XVT_TopLevelWin`
Usage	Implementation

The menu window class defines the interface common to all windows that have menus.

Member Variables

XVT_MenuWin::Menu

A POINTER TO THE WINDOW'S MENU

Declaration

```
protected:

XVT_Menu* Menu;
```

Description

A pointer to the window's menu. Typically, you use this member when replacing default menu items with you own in a window's `e_create` implementation.

Member Functions

XVT_MenuWin::e_close

RECEIVE NOTIFICATION OF A CLOSE REQUEST

Prototypes

```
virtual void
e_close()
```

Description

This member function must be overridden by a window subclass if the application wishes to take any actions in response to a close request from the user.

A call to `e_close` is generated whenever the user tries to close the window by some means other than selecting close on the file menu (which generates an `e_action` call on the appropriate menu item).

When this event is received, the window hasn't actually been closed; your application must explicitly call `Close` to accomplish that. Additional event handler member functions (such as `e_focus`) can then be called for the window, and your application must be

prepared to handle them. The last event handler member function called for a window is `e_destroy`.

If the `e_close` implementation does not call `Close`, then the window will not be closed, and nothing in the application will change. This distinction is important. Typically, a window will check its state when `e_close` is called. If the state indicates that the contents of the window have been saved (for example), then the application may simply call `Close`. If, however, the contents have not been saved, the application may display a dialog asking if the user wishes to save or discard changes, so that the changes may be preserved before the call to `Close` is made.

XVT_MenuWin::e_font

RECEIVE NOTIFICATION OF A FONT CHANGE

Prototypes

```
virtual void
e_font(
        XVT_Font                font,
        FONT_PART               part )
```

Parameters

`font`
The new font.

`part`
The part of the font which changed.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to font changes involving the window.

XVT_MenuWin::GetMenu

RETRIEVE THE CURRENT MENU

Prototypes

```
XVT_Menu*
GetMenu()
```

Return Value

A pointer to the menu currently attached to the window.

Description

Dissociates the menu from the window and returns a pointer to the menu. You must either delete it or give it back to `SetMenu`.

Equivalent C Function

`win_menu_fetch()`

XVT_MenuWin::GetTitle

RETRIEVE THE WINDOW'S TITLE

Prototypes

```
BOOLEAN
GetTitle(
        char*                   buffer,
        unsigned long*          len ) const
```

Parameters

`buffer`
Storage for the title string.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the application's name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

Description

Retrieves the window's current title. The title retrieved reflects whatever is stored in the native window. In particular, if the native window has truncated the title, or if text was added to the title by `SetDocTitle`, those modifications will be present in the title returned.

Equivalent C Function

`get_title()`

XVT_MenuWin::SetDocTitle

SET A WINDOW'S TITLE

Prototypes

```
void
SetDocTitle(
        const char*             str )
```

Parameters

`str`
A null-terminated string containing the window's new title.

Description

This function is similar to `SetTitle`, differing only in that it takes the given string and forms a title that conforms to the native style guidelines for document windows. Typically the application name given in the `XVT_Config` instance is prepended to the title.

Equivalent C Function

`set_doc_title()`

XVT_MenuWin::SetFontMenu

SET FONT MENU CHECKMARKS

Prototypes

```
void
SetFontMenu(
        XVT_Font                font )
```

Parameters

`font`
The selected font that is to be reflected in the font menu. A null pointer indicates that no font is to be selected.

Description

This function makes the font menu show the font and style given by `font` as being selected.

If your application is one where a single font is used throughout the entire window (e.g., a text editor), then you should set the font menu to the `XVT_Font` displayed in the window. If, however, your

application allows for the display and selection of different text objects drawn with different fonts, then it should set the font menu check marks to match the XVT_Font used in drawing the currently selected item. If there is no currently selected item, then the font menu should either be completely unchecked, or should be set to the XVT_Font that would be used if a new text item were created.

Implementation Notes

On the Mac, the point sizes on the Style menu that correspond to the real fonts that are available are outlined, instead of checked.

Equivalent C Function

```
win_set_font_menu()
```

XVT_MenuWin::SetMenu

SET THE CURRENT MENU

Prototypes

```
XVT_Menu*
SetMenu(
        XVT_Menu*               menu )
```

Parameters

menu
: The menu that will become the window's menu when the SetMenu call completes.

Return Value

The menu replaced by menu. You must delete the old menu.

Description

Replaces a window's menu with the menu specified by menu. The menu pointed to by menu is copied, not consumed.

Equivalent C Function

```
win_menu_show()
```

XVT_MenuWin::SetTitle

SET A WINDOW'S TITLE

Prototypes

```
void
SetTitle(
        const char*          str )
```

Parameters

`str`
A null-terminated string containing the window's new title.

Description

Modifies the title field of the window to display the title passed in `str`.

Equivalent C Function

`set_title()`

Implementation Members

`GetMenuNode`
`TitleProtocol`
`DoInit`
`CommandEvent`

Inherited Member Functions

From XVT_ChildBase

page 49 `virtual void e_hscroll( SCROLL_CONTROL activity, short pos )`

page 49 `virtual void e_vscroll( SCROLL_CONTROL activity, short pos )`

page 50 `XVT_TextEdit* GetActiveTextEdit()`

page 50 `XVT_Pnt GetCaretPos() const`

page 51 `BOOLEAN GetCaretState() const`

page 51 `BOOLEAN GetEnabledState()`

page 51 `XVT_ChildBase *GetParent() const`

page 52 long GetScrollPosition(SCROLL_TYPE scroll_type) const

page 52 long GetScrollProportion(SCROLL_TYPE scroll_type) const

page 53 void GetScrollRange(SCROLL_TYPE scroll_type, long *min, long *max) const

page 54 XVT_TextEdit* GetTextEdit(long id)

page 54 BOOLEAN GetVisibleState()

page 55 void MakeFront()

page 55 void ReleaseMouse()

page 56 void SetCaretDimensions(XVT_Pnt vector)

page 56 void SetCaretPos(XVT_Pnt point)

page 57 void SetCaretState(BOOLEAN state)

page 57 void SetCursor(CURSOR cursor)

page 58 void SetEnabledState(BOOLEAN state)

page 59 void SetScrollPosition(SCROLL_TYPE scroll_type, long position)

page 60 void SetScrollProportion(SCROLL_TYPE scroll_type, long proportion)

page 60 void SetScrollRange(SCROLL_TYPE scroll_type, long min, long max, long pos)

page 61 void SetVisibleState(BOOLEAN f)

page 62 void TrapMouse()

From XVT_DrawableContainer

page 129 void Clear()

page 129 void Clear(XVT_Color color)

page 129 void Close()

page 128 XVT_BaseDrawProto* DrawProtocol

page 130
```
virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)
```

page 131 virtual void e_create()

page 132 virtual void e_destroy()

page 132 virtual void e_focus(BOOLEAN active)

page 133
```
virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 134
```
virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 136 virtual void e_size(XVT_Rct boundary)

page 137 virtual void e_timer(long id)

page 137 virtual void e_update(XVT_Rct boundary)

page 139 virtual long e_user(long id, void *data)

page 140 XVT_Control *GetCtl(long cid)

page 140 long GetCtlCount()

page 141 EVENT_MASK GetEventMask() const

page 141 XVT_Control *GetFirstCtl()

page 142 XVT_ChildBase *GetFirstWin()

page 142 XVT_Control *GetNextCtl()

page 143 XVT_ChildBase *GetNextWin()

page 143 long GetWinCount()

page 144 void Invalidate()

page 144 void Invalidate(XVT_Rctregion)

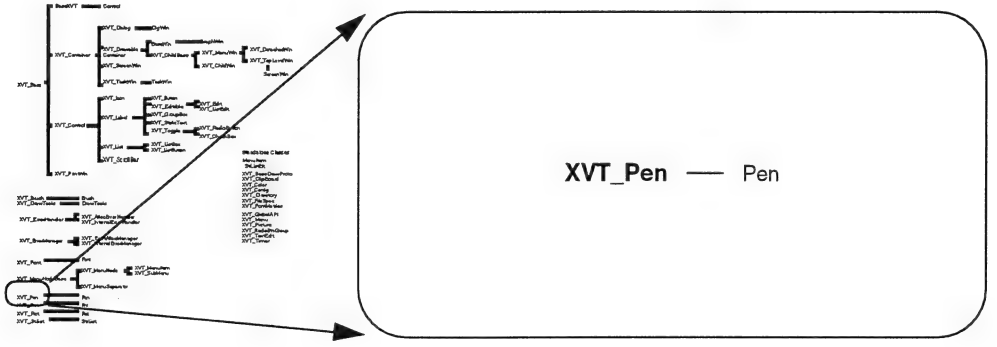
page 145
```
void Scroll(
XVT_Rct boundary,
long dh,
long dv )
```

page 146 void SetEventMask(EVENT_MASK ask)
page 148 void SetInnerRect(XVT_Rct r)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_Pen



Overview

Header File	`tools.h`
Source File	`tools.cc`
Superclass	
Subclasses	`Pen`
Usage	Concrete

Instances of the pen class define how outlines of drawing primitives may be rendered.

Constructors

```
XVT_Pen()
XVT_Pen( short width, PAT_STYLE pattern,
    PEN_STYLE style, XVT_Color color )
```

Create a new pen with the given width, pattern, style, and color. Equivalent to using the default constructor followed by `SetWidth`, `SetPattern`, `SetStyle`, and `SetColor`.

```
XVT_Pen( const XVT_Pen& pen )
~XVT_Pen()
```

Operators

```
XVT_Pen& operator=( const XVT_Pen& pen )
BOOLEAN operator==( const XVT_Pen& pen )
```

Pens may be assigned and compared for equality.

Member Functions

XVT_Pen::GetColor

RETRIEVE A PEN'S COLOR

Prototypes

```
XVT_Color
GetColor() const
```

Return Value

The pen's current color.

XVT_Pen::GetPattern

RETRIEVE A PEN'S PATTERN

Prototypes

```
PAT_STYLE
GetPattern() const
```

Return Value

The pen's current pattern.

XVT_Pen::GetStyle

RETRIEVE A PEN'S STYLE

Prototypes

```
PEN_STYLE
GetStyle() const
```

Return Value

The pen's current style.

XVT_Pen::GetWidth

RETRIEVE A PEN'S WIDTH

Prototypes

```
short
GetWidth() const
```

Return Value

The pen's width.

XVT_Pen::SetColor

SET A PEN'S COLOR

Prototypes

```
void
SetColor(
        XVT_Color               color )
```

Parameters

color
The pen's new color.

Description

Sets a pen's color.

XVT_Pen::SetPattern

SET A PEN'S PATTERN

Prototypes

```
void
SetPattern(
        PAT_STYLE               pattern )
```

Parameters

`pattern`
The new pen pattern.

The following members of the `PAT_STYLE` enumeration are valid for pens:

`PAT_SOLID`
Produces a solid line.

`PAT_HOLLOW`
Produces no outline at all.

`PAT_RUBBER`
Produces a grayish or dotted line that conforms to the native window system's look for rubber banding.

Description

Sets a pen's pattern.

XVT_Pen::SetStyle

SET A PEN'S STYLE

Prototypes

```
void
SetStyle(
        PEN_STYLE               style )
```

Parameters

`style`
The new pen style.

Members of the `PEN_STYLE` enumeration are:

`P_SOLID`
Produces a solid line.

`P_DOT`
Produces a dotted line.

`P_DASH`
Produces a dashed line.

Description

Sets a pen's style.

XVT_Pen::SetWidth

SET A PEN'S WIDTH

Prototypes

```
void
SetWidth(
        short                   width )
```

Parameters

`width`
The new pen width.

Description

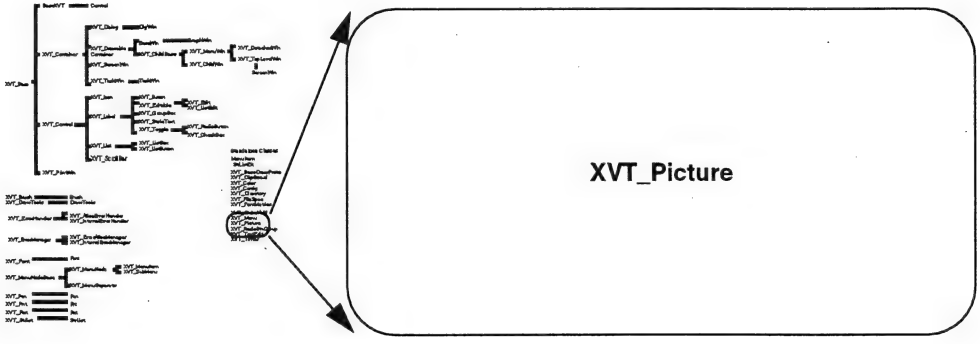
Sets a pen's width.

A pen's width is the width in pixels of the line produced by a pen stroke.

Implementation Members

`ConvertTo`
`ConvertFrom`
`Width`
`Pattern`
`Style`
`Color`

XVT_Picture



Overview

Header File	`picture.h`
Source File	`picture.cc`
Superclass	
Subclasses	
Usage	Concrete

Instances of `XVT_Picture` represent collections of drawing primitives as drawn to a particular window. Pictures may be recorded in any drawable window, written to the clipboard, or converted into opaque data.

Example

The following code shows how to create a picture in a window:

```
{
    XVT_Picture* myPicture;
    XVT_DrawableContainer* myWindow;
    XVT_RCT itsClientArea;
        .
        .
        .

    itsClientArea = myWindow->GetInnerRect();

    new XVT_Picture(
            myWindow,
            itsClientArea.Normalize() )

//  drawing operations in myWindow are recorded
//  in myPicture
        .
        .
        .

    myPicture->Close()

// myPicture is now ready to use, it may be drawn
//  in any drawable or converted into opaque data.
}
```

Constructors

`XVT_Picture( XVT_DrawableContainer *drawable, XVT_Rct boundary )`

Create a new picture in a window. The new picture captures all drawing done in drawable that is inside boundary until the `Close` member function is called. After the c member function as been called, the picture can be drawn or turned into opaque data using `GetOpaqueData`.

Equivalent to picture_open.

`XVT_Picture( const char* buffer, long size, XVT_Rct boundary )`

Create a picture from opaque data.

Equivalent to `picture_make`.

`~XVT_Picture()`

Member Functions

XVT_Picture::Close

STOP RECORDING DRAWING PRIMITIVES

Prototypes

```
void
Close()
```

Description

Stops recording drawing primitives and creates the picture.

This member function causes an error unless the picture was created with the `XVT_Picture( XVT_DrawableContainer *drawable, XVT_Rct boundary )` constructor.

Equivalent C Function

```
picture_close()
```

XVT_Picture::GetLockedState

DETERMINE IF THE PICTURE IS CURRENTLY LOCKED

Prototypes

```
BOOLEAN
GetLockedState() const
```

Return Value

`TRUE` if the picture is currently locked, `FALSE` if not.

XVT_Picture::GetOpaqueData

CONVERT A PICTURE INTO OPAQUE DATA

Prototypes

```
void
GetOpaqueData(
        char*                   buffer ) const
```

Parameters

`buffer`
A buffer to hold the picture data. The buffer must be at least as big as the number returned by `GetOpaqueDataSize`.

Description

Converts a picture into opaque data. The opaque picture data is not portable. If you write picture data to a file you will *not* be able to read that data in and create a picture on any platform with a different architecture or window system.

Implementation Notes

XVT/Mac
A picture is a `PICT`.

XVT/Win, XVT/PM
A picture is a bitmap.

XVT/CH
A picture is a character map.

Equivalent C Function

`picture_lock()`

`picture_unlock()`

XVT_Picture::GetOpaqueDataSize

DETERMINE THE SIZE OF BUFFER TO HOLD OPAQUE DATA

Prototypes

```
long
GetOpaqueDataSize() const
```

Return Value

The minimum size in bytes of buffer necessary to store an opaque representation of this picture.

Equivalent C Function

`picture_lock()`

XVT_Picture::GetOpenState

DETERMINE IF THE PICTURE IS CURRENTLY OPEN

Prototypes

```
BOOLEAN
GetOpenState() const
```

Return Value

TRUE if the picture is currently open, FALSE if not.

XVT_Picture::Lock

LOCK A PICTURE"S DATA

Prototypes

```
BOOLEAN
Lock()
```

Return Value

TRUE if the picture was successfully locked, FALSE if not.

Description

Prepare to obtain the picture's opaque data.

Equivalent C Function

```
picture_lock()
```

XVT_Picture::Unlock

UNLOCK A PICTURE'S DATA

Prototypes

```
void
Unlock()
```

Return Value

TRUE if the picture was successfully unlocked, FALSE if not.

Description

Release a picture's opaque data.

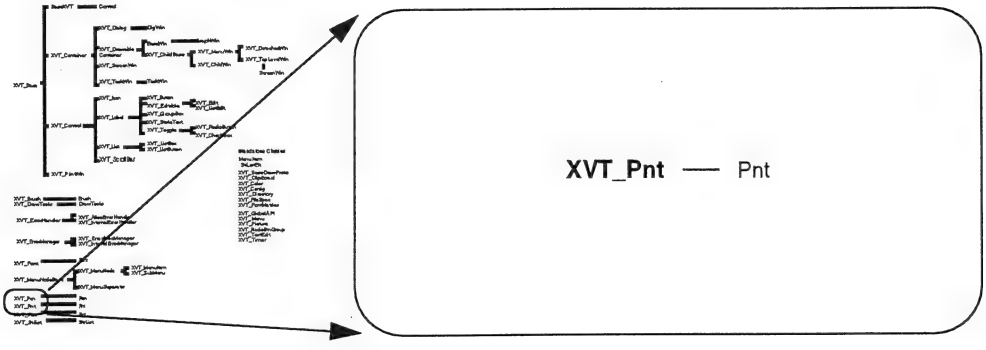
Equivalent C Function

```
picture_unlock()
```

Implementation Members

```
GetDrawable
GetPictData
PictData
OpaqueData
OpaqueDataSize
Drawable
OpenState
LockedState
DoInit
```

XVT_Pnt



Overview

Header File	pnt.h
Source File	pnt.cc
Superclass	
Subclasses	Pnt
Usage	Concrete

Instances of the point class model mathematical points.

Constructors

```
XVT_Pnt( short x = 0, short y = 0 )
XVT_Pnt( const XVT_Pnt& point )
virtual ~XVT_Pnt()
```

Operators

```
XVT_Pnt& operator=( const XVT_Pnt& point )
BOOLEAN operator==( const XVT_Pnt& point ) const
BOOLEAN operator!=( const XVT_Pnt& point ) const
```

```
BOOLEAN operator>( const XVT_Pnt& point ) const
BOOLEAN operator>=( const XVT_Pnt& point ) const
BOOLEAN operator<( const XVT_Pnt& point ) const
BOOLEAN operator<=( const XVT_Pnt& point ) const
XVT_Pnt operator+( const short offset ) const
XVT_Pnt& operator+=( const short offset )
XVT_Pnt operator+( const XVT_Pnt& point ) const
XVT_Pnt& operator+=( const XVT_Pnt& point )
XVT_Pnt operator-( const short offset ) const
XVT_Pnt& operator-=( const short offset )
XVT_Pnt operator-( const XVT_Pnt& point ) const
XVT_Pnt& operator-=( const XVT_Pnt& point )
XVT_Pnt operator*( const short factor ) const
XVT_Pnt& operator*=( const short factor )
```

Member Functions

XVT_Pnt::GetX

RETRIEVE A POINT'S X COORDINATE

Prototypes

```
virtual short
GetX() const
```

Return Value

The point's X coordinate.

XVT_Pnt::GetY

RETRIEVE A POINT'S Y COORDINATE

Prototypes

```
virtual short
GetY() const
```

Return Value

The point's Y coordinate.

XVT_Pnt::SetX

SET A POINT'S X COORDINATE

Prototypes

```
virtual void
SetX(
        short                   pos )
```

Parameters

pos
The point's new X coordinate.

Description

Sets a point's X coordinate.

XVT_Pnt::SetY

SET A POINT'S Y COORDINATE

Prototypes

```
virtual void
SetY(
        short                   pos )
```

Parameters

pos
The point's new Y coordinate.

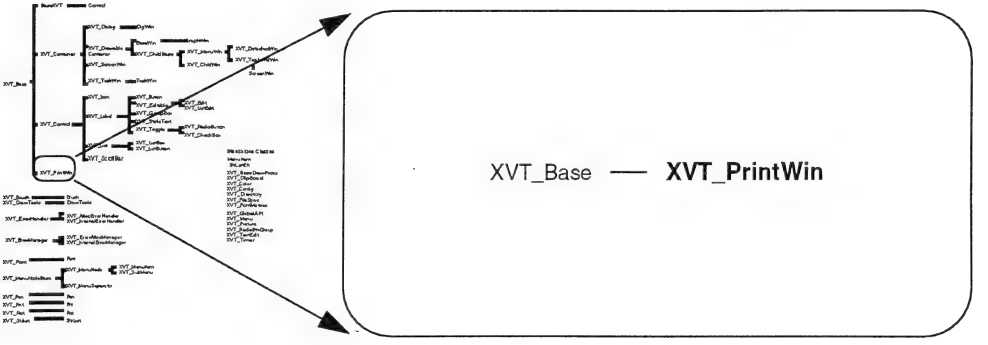
Description

Sets a point's Y coordinate.

Implementation Members

ConvertTo
ConvertFrom
X
Y

XVT_PrintWin



Overview

Header File	`printwin.h`
Source File	`printwin.cc`
Superclass	`XVT_Base`
Subclasses	
Usage	Abstract

Print windows are used to structure the interface to printing. Print windows have the same drawing interface as any other drawable window; however, they do not have any event handler member functions. Instead three virtual member functions control the print loop.

Before creating a print window, you should already have invoked `PageSetup` to set up the printer.

Because the print job can run in a separate thread, there is no way for XVT++ application to know when it has completed. For this reason, the print window must delete itself when the print job has completed. You should never delete a print window, nor should you allocate one by any other means than `new`.

Example

```
class MyPrintWin : public XVT_PrintWin
{
    BOOLEAN AnotherPage();
    void DrawInit();
    void DrawAction();
};
    .
    .
    .

{
    XVT_PrintWin* thePrintWin;

    thePrintWin = new MyPrintWin( "My Print Job" );
    thePrintWin->Init();

// NOTE: do not delete thePrintWin
}
```

Constructors

```
XVT_PrintWin( const char* jobName = NULL )
virtual ~XVT_PrintWin()
```

Member Fields

XVT_PrintWin::DrawProtocol

THE PRINT WINDOW'S DRAWING PROTOCOL

Prototype

```
XVT_BaseDrawProto*
DrawProtocol
```

Description

The drawing protocol provides access to all of the XVT++ drawing functionality. Access to drawing functionality is indirected in this manner so that the drawing code can be made to work for both windows and print windows.

Member Functions

XVT_PrintWin::AnotherPage

DETERMINE IF ANOTHER PAGE IS TO BE PRINTED

Prototypes

```
protected:

virtual BOOLEAN
AnotherPage() = 0
```

Return Value

A flag that is TRUE if another page is to be printed, FALSE if not. If false is returned, the print job is terminated.

Description

You must override this function.

The print window calls it immediately before starting each page.

XVT_PrintWin::DrawAction

DRAW A PRINT BAND

Prototypes

```
protected:

virtual void
DrawAction() = 0
```

Description

You must override this function.

The print window calls `DrawAction` once for each band printed. There is at least one print band per page. Print bands are not necessarily disjoint; some environments will in fact use several bands with identical boundaries, printing different primitives in each band.

XVT_PrintWin::DrawInit

PREPARE TO PRINT

Prototypes

```
protected:

virtual void
DrawInit()
```

Description

You can override this function.

Your implementation should initialize any context (page number, draw tools, and so on) that you need for the print job.

XVT_PrintWin::GetOutputFile

RETRIEVE THE OUTPUT FILE NAME

Prototypes

```
#if XVTWS == MTFWS || XVTWS == XOLWS || XVTWS == WMWS

BOOLEAN
GetOutputFile(
        char*                   buffer,
        unsigned long*          len ) const

#endif
```

Parameters

`buffer`
Storage to receive the output file name.

`len`
A pointer to the length of buffer.

Return Value

`TRUE` if the length of `buffer` was sufficient to hold the output file name, `FALSE` if not. If `FALSE` is returned, `len` is set to the required length.

Implementation Notes

XVT/XM, XVT/XOL, XVT/CH

This function is available only with XVT/XM, XVT/XOL and XVT/CH. Attempts to use it in other environments will result in a compile-time error.

Equivalent C Function

```
get_value( ATTR_PS_PRINT_FILE_NAME )
```

XVT_PrintWin::GetPrintRcd

RETRIEVE A COPY OF THE PRINT WINDOW'S PRINT RECORD

Prototypes

```
void*
GetPrintRcd() const
```

Return Value

A pointer to the print window's print record. The record may be copied as opaque data. The size of the record may be obtained by calling `GetPrintRcdSize`.

XVT_PrintWin::GetPrintRcdSize

RETRIEVE THE SIZE OF THE PRINT RECORD

Prototypes

```
long
GetPrintRcdSize() const
```

Return Value

This size of the print record in bytes.

XVT_PrintWin::Init

INITIALIZE A PRINT WINDOW

Prototypes

```
BOOLEAN
Init()
```

Description

Creates the underlying print window and starts printing. If supported, printing takes place in a separate thread.

Implementation Notes

XVT/PM

Since printing uses a separate thread, you need to take care that ongoing modifications to the model being printed do not corrupt the print thread.

Equivalent C Function

```
start_print_thread()
```

XVT_PrintWin::SetOutputFile

SET THE OUTPUT FILE NAME

Prototypes

```
#if XVTWS == MTFWS || XVTWS == XOLWS || XVTWS == WMWS

void
SetOutputFile(
        const char*             name )

#endif
```

Parameters

name

The new output file name.

Description

Sets the output file name.

Implementation Notes

XVT/XM, XVT/XOL, XVT/CH

This function is available only with XVT/XM, XVT/XOL and XVT/CH. Attempts to use it in other environments will result in a compile-time error.

Equivalent C Function

```
set_value( ATTR_PS_PRINT_FILE_NAME )
```

XVT_PrintWin::SetPrintRcd

SET THE PRINT WINDOW'S PRINT RECORD

Prototypes

```
void
SetPrintRcd(
        void* print_rcd )
```

Parameters

`print_rcd`

A pointer to the opaque print record structure. It will be copied, not consumed.

Description

Set the print window's print record. The print record provides additional parameters, such as page orientation, to the native print driver.

XVT_PrintWin::ValidatePrintRcd

VALIDATE THE PRINT RECORD

Prototypes

```
BOOLEAN
ValidatePrintRcd()
```

Return Value

`TRUE` if the print record was modified and should be saved, `FALSE` if not.

Description

This function ensures that the current print record is valid for the current system configuration. You use this function after setting a print record read from a document file.

Implementation Notes

XVT/Mac
: The current printer is chosen with the Chooser Desk Accessory. This function will validate a print record against the current printer.

XVT/Win, XVT/PM
: The current printer is stored as a part of the print record. This function will make sure that that printer exists and that its settings are valid.

Implementation Members

```
CloseProtocol
PrintRct
Size
Title
InitProtocols
```

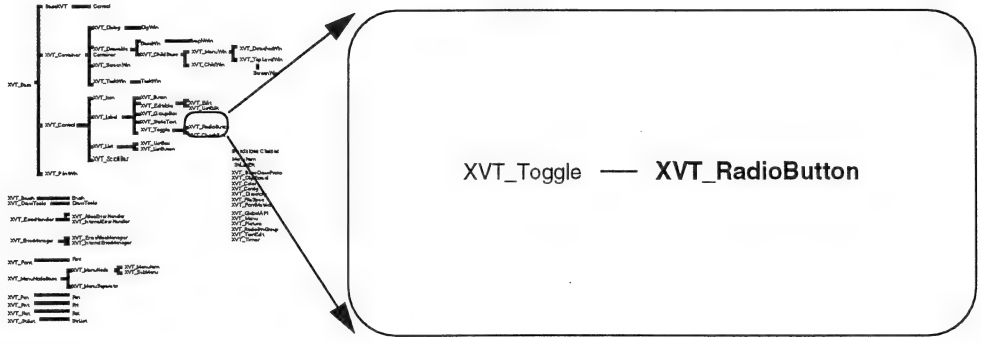
Inherited Member Functions

From XVT_Base

page 11	`virtual BaseWin* CastToBaseWin()`
page 10	`virtual DlgWin* CastToDlgWin()`
page 10	`virtual ScreenWin* CastToScreenWin11()`
page 10	`virtual TaskWin* CastToTaskWin11()`
page 11	`virtual XVT_Button *CastToButton()`
page 11	`virtual XVT_CheckBox *CastToCheckBox()`
page 11	`virtual XVT_ChildWin *CastToChildWin()`
page 11	`virtual XVT_DetachedWin *CastToDetachedWin()`
page 11	`virtual XVT_Dialog *CastToDialog()`
page 11	`virtualXVT_DrawableContainer*CastToDrawableContainer()`

page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_RadioButton



Overview

Header File	`radiobtn.h`
Source File	`radiobtn.cc`
Superclass	`XVT_Toggle`
Subclasses	
Usage	Abstract

The `XVT_RadioButton` class specifies the interface to radio buttons.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Radio buttons are similar to check boxes. The user can turn radio buttons on or off like check boxes. However, radio buttons are different from check boxes in two respects: only one radio button in the group can be on (the rest must be off), and radio buttons have a different shape.

Radio buttons are always used in conjunction with a radio button group, which makes sure that only one button at a time is depressed. Radio button groups are instances of `XVT_RadioBtnGroup`. Other than the constructor, radio button groups have no public interface.

Example

Here is how to create a group of three radio buttons:

```
MyWin::e_create()
{
    XVT_RadioBtnGroup* theGroup;
    XVT_RadioButton* theNewButton;
    XVT_Rct buttonBoundary =
            XVT_Rct( 100, 100 200, 124 );
    XVT_Pnt buttonOffset = XVT_Pnt( 0, 24 );

    theGroup = new XVT_RadioButtonGroup;

    theNewButton = new MyRadio( this, theGroup, 1001 );
    theNewButton->Init(
            buttonBoundary,
            0,
            "choice 1" );

    buttonBoundary += buttonOffset;
    theNewButton = new MyRadio( this, theGroup, 1002 );
    theNewButton->Init(
            buttonBoundary,
            0,
            "choice 2" );

    buttonBoundary += buttonOffset;
    theNewButton = new MyRadio( this, theGroup, 1003 );
    theNewButton->Init(
            buttonBoundary,
            0,
            "choice 3" );
}
```

Note that the control IDs must still be sequential integers.

Constructors

```
XVT_RadioButton(
    XVT_Dialog* parent,
    XVT_RadioBtnGroup* group,
    long id )
```

```
XVT_RadioButton(
    XVT_DrawableContainer* parent,
    XVT_RadioBtnGroup* group
    long id )
```

Create a radio button in the given radio button group.

```
XVT_RadioBtnGroup()
```

Create a radio button group. The only use for a radio button group is as an argument to a radio button constructor.

```
virtual ~XVT_RadioButton()
```

Member Functions

XVT_RadioButton::SetCheckedState

CHECK OR UNCHECK A RADIO BUTTON

Prototypes

```
void
SetCheckedState()
```

Description

Check a radio button and uncheck all other radio buttons in its group.

Equivalent C Function

```
win_check_radio_button()
```

Implementation Members

```
Group
```

Inherited Member Functions

From XVT_Toggle

page 394 `virtual void e_action()`

page 394 `virtual BOOLEAN GetCheckedState()`

From XVT_Label

page 239 `void GetTitle( char* str, unsigned long* len )`

page 239 `virtual BOOLEAN Init( XVT_Rct boundary, long = 0L, char * = NULL )`

page 240 `void SetTitle( char* str )`

From XVT_Control

page 92 `virtual void Close()`

page 93 `virtual void e_create()`

page 93 `virtual void e_destroy()`

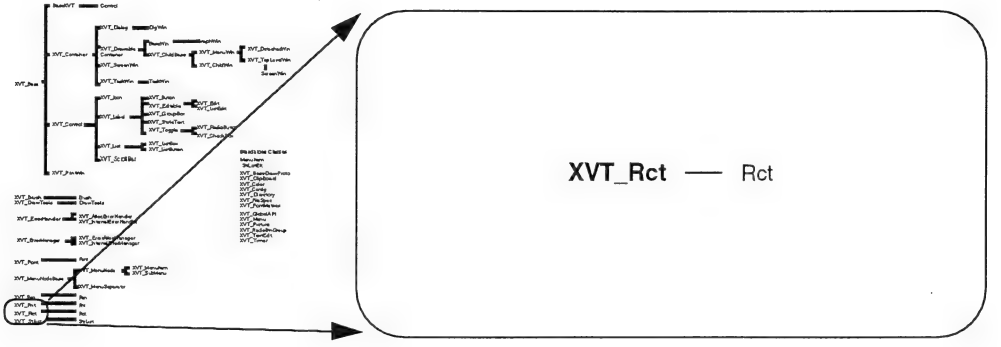
page 94 virtual long e_user(long id, void *data)
page 95 BOOLEAN GetEnabledState()
page 95 long GetID(void)
page 95 XVT_Base *GetParent(void)
page 96 BOOLEAN GetVisibleState()
page 96 void Init()
page 96 void MakeFront()
page 97 void SetEnabledState(BOOLEAN state)
page 98 void SetInnerRect(XVT_Rct boundary)
page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_Rct



Overview

Header File	rct.h
Source File	rct.cc
Superclass	
Subclasses	Rct
Usage	Concrete

Instances of this class model mathematical rectangles.

Constructors

```
XVT_Rct()
XVT_Rct( XVT_Pnt top_left, XVT_Pnt bottom_right )
XVT_Rct( long top, long left, long bottom, long right )
XVT_Rct( XVT_Pnt top_left, long width, long height )
XVT_Rct( const XVT_Rct& rect )
~XVT_Rct()
```

Operators

```
XVT_Rct& operator=( const XVT_Rct& rect )
BOOLEAN operator==( const XVT_Rct& rect ) const
BOOLEAN operator!=( const XVT_Rct& rect ) const
XVT_Rct operator+( const XVT_Pnt& point ) const
XVT_Rct& operator+=( const XVT_Pnt& point )
XVT_Rct operator+( const short offset ) const
XVT_Rct& operator+=( const short offset )
```

Member Functions

XVT_Rct::Constrain

CONSTRAIN A POINT TO BE INSIDE A RECTANGLE

Prototypes

```
XVT_Pnt
Constrain(
        XVT_Pnt                 point ) const
```

Parameters

`point`
The point to be constrained to the rectangle.

Return Value

The point closest to `point` which is inside the rectangle.

Description

Constrains a point to lie within a rectangle.

XVT_Rct::Contains

DETERMINE IF A RECTANGLE CONTAINS A POINT OR ANOTHER RECTANGLE

Prototypes

```
BOOLEAN
Contains(
        XVT_Rct                 rect ) const

BOOLEAN
Contains(
        XVT_Pnt                 point ) const
```

Parameters

`rect`
A rectangle.

`point`
A point.

Return Value

A flag that is `TRUE` if the argument object is contained by the rectangle, `FALSE` if not.

Description

A point `(x, y)` is contained in a rectangle $((x_{ul}, y_{ul}), (x_{lr}, y_{lr}))$ if the following conditions are met:

$$x_{ul} \leq x < x_{lr}$$

$$y_{ul} \leq y < y_{lr}$$

A rectangle is contained by another rectangle if both corner points are contained.

`Contains( rect )`
Determines if the rectangle contains another rectangle.

`Contains( point )`
Determines if a rectangle contains a point.

Equivalent C Function

`pt_in_rect()`

XVT_Rct::Difference

COMPUTE THE DIFFERENCE OF TWO RECTANGLES

Prototypes

```
short
Difference(
        XVT_Rct&            boundary,
        XVT_Rct             list[] ) const
```

Parameters

`boundary`
The subtrahend rectangle.

`list`
An array of four rectangles to receive the difference rectangles.

Return Value

The number of rectangles in the difference. The difference between two rectangles can always be expressed as the union of between 0 and 4 rectangles. If there are 0 rectangles in the difference it indicates that `this` and `boundary` are the same.

Description

Computes the difference of two rectangles. The difference is defined as the area that is in `this` but not in `boundary`.

XVT_Rct::GetBottomLeft

RETRIEVE THE LOWER-LEFT CORNER OF A RECTANGLE

Prototypes

```
XVT_Pnt
GetBottomLeft() const
```

Return Value

The point at the lower-left corner of the rectangle.

XVT_Rct::GetBottomRight

RETRIEVE THE LOWER-RIGHT CORNER OF A RECTANGLE

Prototypes

```
XVT_Pnt
GetBottomRight() const
```

Return Value

The point at the lower-right corner of the rectangle.

XVT_Rct::GetDimVect

RETRIEVE A RECTANGLE'S DIMENSIONS

Prototypes

```
XVT_Pnt
GetDimVect() const
```

Return Value

A point whose X value is the width of the rectangle and whose Y value is the height of the rectangle.

XVT_Rct::GetTopLeft

RETRIEVE THE UPPER-LEFT CORNER OF A RECTANGLE

Prototypes

```
XVT_Pnt
GetTopLeft() const
```

Return Value

The point at the upper left corner of the rectangle.

XVT_Rct::GetTopRight

RETRIEVE THE UPPER-RIGHT CORNER OF A RECTANGLE

Prototypes

```
XVT_Pnt
GetTopRight() const
```

Return Value

The point at the upper right corner of the rectangle.

XVT_Rct::Height

RETRIEVE A RECTANGLE'S HEIGHT

Prototypes

```
short
Height() const
```

Return Value

The rectangle's height.

XVT_Rct::Intersect

COMPUTE THE INTERSECTION OF TWO RECTANGLES

Prototypes

```
BOOLEAN
Intersect(
        XVT_Rct&            boundary,
        XVT_Rct*            intersection ) const
```

Parameters

`boundary`
The rectangle to check against this one for intersection.

`intersection`
A pointer to a rectangle in which to store the intersection rectangle if there is one.

Return Value

A flag that is TRUE if the rectangles intersect, FALSE if they are disjoint.

Description

Compute the intersection of two rectangles.

Equivalent C Function

```
rect_intersect()
```

XVT_Rct::IsEmpty

DETERMINE IF A RECTANGLE IS EMPTY

Prototypes

```
BOOLEAN
IsEmpty() const
```

Return Value

A flag that is TRUE if the rectangle is empty, FALSE if not.

Equivalent C Function

```
is_rect_empty()
```

XVT_Rct::Normalize

NORMALIZE A RECTANGLE

Prototypes

```
XVT_Rct
Normalize() const
```

Return Value

A rectangle with the same dimensions but with its upper-left corner being (0,0).

XVT_Rct::SetBottomLeft

SET THE LOWER-LEFT CORNER OF A RECTANGLE

Prototypes

```
void
SetBottomLeft(
        XVT_Pnt                 point )
```

Parameters

`point`
The new point at the lower-left corner of the rectangle.

Description

Sets the lower-left corner of the rectangle.

XVT_Rct::SetBottomRight

SET THE LOWER-RIGHT CORNER OF A RECTANGLE

Prototypes

```
void
SetBottomRight(
        XVT_Pnt                 point)
```

Parameters

`point`
The new point at the lower-right corner of the rectangle.

Description

Sets the lower-right corner of the rectangle.

XVT_Rct::SetTopLeft

SET THE UPPER-LEFT CORNER OF A RECTANGLE

Prototypes

```
void
SetTopLeft(
        XVT_Pnt                 point )
```

Parameters

`point`
The new point at the upper-left corner of the rectangle.

Description

Sets the upper-left corner of the rectangle.

XVT_Rct::SetTopRight

SET THE UPPER-RIGHT CORNER OF A RECTANGLE

Prototypes

```
XVT_Pnt
SetTopRight(
        XVT_Pnt                 point )
```

Parameters

`point`
The new point at the upper-right corner of the rectangle.

Description

Sets the upper-right corner of the rectangle.

XVT_Rct::TransToGlobal

TRANSLATE A POINT RELATIVE TO A RECTANGLE

Prototypes

```
XVT_Pnt
TransToGlobal(
        XVT_Pnt                 point ) const
```

Parameters

`point`
A point relative to the rectangle.

Return Value

A point in the same coordinate system as the rectangle.

Description

Translates a point specified relative to the rectangle to the global coordinate system.

XVT_Rct::TransToLocal

TRANSLATE A POINT RELATIVE TO THE ORIGIN

Prototypes

```
XVT_Pnt
TransToLocal(
        XVT_Pnt                 point ) const
```

Parameters

`point`
A point in the same coordinate system as the rectangle.

Return Value

The same point relative to the rectangle's origin.

Description

Translates a point from the rectangle's coordinate system to the coordinate system whose origin is the same as the rectangle's upper-left corner.

XVT_Rct::Width

RETRIEVE A RECTANGLE'S WIDTH

Prototypes

```
short
Width() const
```

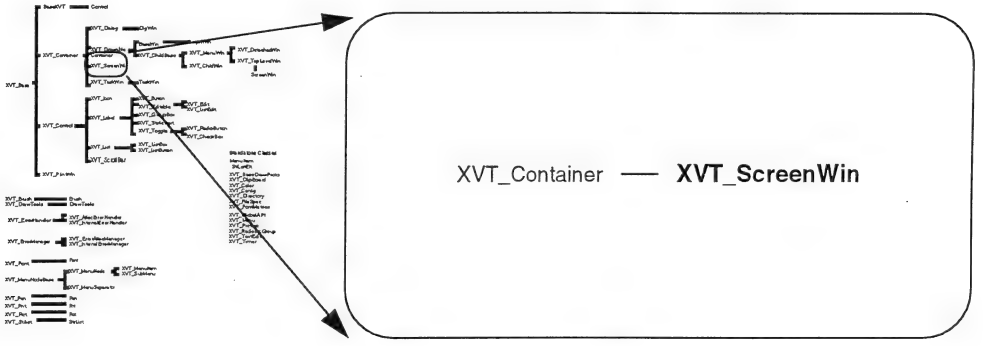
Return Value

The rectangle's width.

Implementation Members

`ConvertTo`
`ConvertFrom`
`MakeCorners`
`TopLeft`
`BottomRight`

XVT_ScreenWin



Overview

Header File	`screen.h`
Source File	`screen.cc`
Superclass	`XVT_Container`
Subclasses	
Usage	Concrete

The `XVT_ScreenWin` class defines the interface to the screen window. There is only one instance of this class and it is created by the task window and kept in the static field `XVT_Base::_ScreenWin`.

The screen window represents the physical display screen. It receives no events. Its boundaries and dimensions reflect the pixel extent of the physical screen.

Constructors

```
XVT_ScreenWin()
virtual ~XVT_ScreenWin()
```

Member Functions

XVT_ScreenWin::GetFirstWin

RETRIEVE THE FIRST WINDOW IN THE LIST OF CHILD WINDOWS AND DIALOGS

Prototypes

```
XVT_Container*
GetFirstWin()
```

Return Value

A pointer to the first window in the list of detached windows and dialogs maintained by this window.

Description

Retrieves the first window in the list of detached windows and dialogs and resets the traversal context used by `GetNextWin` to the beginning of the window list.

You can retrieve all detached windows and dialogs by calling `GetFirstWin` and then calling `GetNextWin` repeatedly until it returns `NULL`.

XVT_ScreenWin::GetNextWin

RETRIEVE THE NEXT WINDOW IN THE LIST OF CHILD WINDOWS AND DIALOGS

Prototypes

```
XVT_Container*
GetNextWin()
```

Return Value

A pointer to the next window or dialog relative to the current traversal context, or `NULL` if the end of the list of detached windows has been reached.

Description

Retrieves the next detached window or dialog and increments the context.

You can retrieve all detached windows and dialogs by calling `GetFirstWin` and then calling `GetNextWin` repeatedly until it returns `NULL`.

Equivalent C Function

```
list_windows()
```

XVT_ScreenWin::GetWinCount

RETRIEVE THE NUMBER OF CHILD WINDOWS AND DIALOGS

Prototypes

```
long
GetWinCount()
```

Return Value

The number of detached windows and dialogs contained by this window.

Implementation Members

```
Install
RemoveWin
Created
```

Inherited Member Functions

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`

page 10 `virtual DlgWin* CastToDlgWin()`

page 10 `virtual ScreenWin* CastToScreenWin11()`

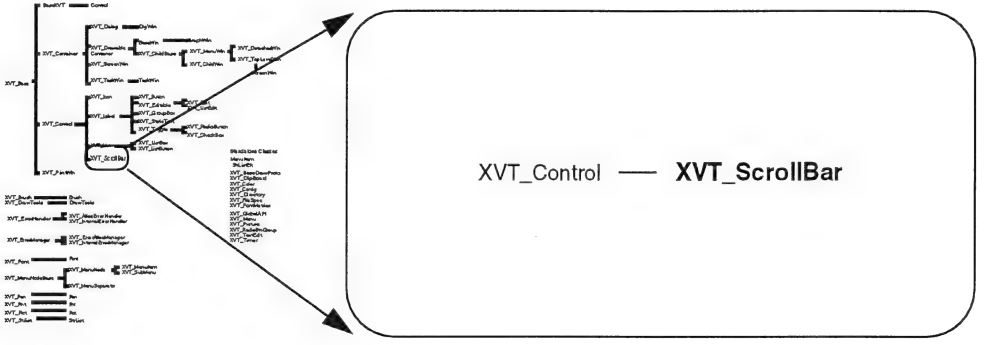
page 10 `virtual TaskWin* CastToTaskWin11()`

page 11 `virtual XVT_Button *CastToButton()`

page 11 `virtual XVT_CheckBox *CastToCheckBox()`

page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_ScrollBar



Overview

Header File	`scroll.h`
Source File	`scroll.cc`
Superclass	`XVT_Control`
Subclasses	
Usage	Abstract

The `XVT_ScrollBar` class specifies the interface to scrollbar controls.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Horizontal or vertical scrollbars are controls that allow the application user to manipulate an integer value in a range. The current value is represented by a "thumb," which can be dragged with the mouse. In addition to the thumb, there are typically ways to increment or decrement the value in small steps, which we call "line-

up" and "line-down," and large steps, which we call "page-up" and "page-down." While the actual meaning of those modifications is defined by the application, the convention is that they work as you might expect for text being scrolled in a window.

Constructors

```
XVT_ScrollBar( XVT_Dialog* parent, long cid,
    long min = 0L, long max = 100L)
XVT_ScrollBar( XVT_DrawableContainer* parent,
    long cid, long min = 0L, long max = 100L)
```

Create a scrollbar in a window or dialog with the given range.

```
virtual ~XVT_ScrollBar()
```

Member Functions

XVT_ScrollBar::e_action

RECEIVE NOTIFICATION OF SCROLLBAR ACTIVITY

Prototypes

```
virtual void
e_action(
        SCROLL_CONTROL          what,
        short                   pos )
```

Parameters

`what`
: What part of the scrollbar was manipulated.

`pos`
: The scrollbar thumb position.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to scrollbar manipulation.

Each mouse click on the scrollbar generates a call to this member function. If the user holds the mouse button down, a series of events will occur.

The appearance of the scroll bar will not change unless your application explicitly modifies it, typically with `SetScrollPosition`.

The `SCROLL_CONTROL` enumeration includes the following values:

`SC_NONE`
: No activity. Ignore.

`SC_LINE_UP`
: Request to move one line up.

`SC_LINE_DOWN`
: Request to move one line down.

`SC_PAGE_UP`
: Request to move one page up.

`SC_PAGE_DOWN`
: Request to move one page down.

`SC_THUMB`
: The thumb has been released at the position given by `pos`.

`SC_THUMBTRACK`
: The thumb has been dragged to the position given by `pos` but has not yet been released. You can safely ignore this type of event if you do not want to scroll as the user drags the thumb.

The interpretation of line and page is entirely up to the application. However, application users expect native look-and-feel guidelines to be followed.

XVT_ScrollBar::GetScrollPosition

RETRIEVE A SCROLLBAR'S THUMB POSITION

Prototypes

```
long
GetScrollPosition() const
```

Return Value

The current position of the thumb.

Equivalent C Function

```
get_scroll_range()
```

XVT_ScrollBar::GetScrollProportion

RETRIEVE A SCROLLBAR'S THUMB PROPORTION

Prototypes

```
long
GetScrollProportion() const
```

Return Value

The current thumb proportion.

Equivalent C Function

```
get_scroll_proportion()
```

XVT_ScrollBar::GetScrollRange

RETRIEVE A SCROLLBAR'S RANGE

Prototypes

```
void
GetScrollRange(
        long*                   min,
        long*                   max ) const
```

Parameters

`min`
A pointer to a variable that receives the minimum.

`max`
A pointer to a variable that receives the maximum.

Equivalent C Function

```
get_scroll_range()
```

XVT_ScrollBar::Init

INITIALIZE A SCROLLBAR

Prototypes

```
virtual BOOLEAN
Init(
        XVT_Rct                 boundary,
        long                    flags = 0L )
```

Parameters

`boundary`
: The bounding rectangle for the scrollbar. If the rectangle is wider than it is tall, the scrollbar will be horizontal, if not, vertical. A boundary with a zero dimension indicates that the system default value for that dimension (width or height) is to be used.

`flags`
: Attribute flags.

Return Value

`TRUE` if the scrollbar was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by the scrollbar. Recovery can be attempted by disposing of the new control, closing another control, and retrying the creation of the control.

Description

Creates the native scrollbar if it does not already exist. If the scrollbar is in a window or dialog that was created from resources, the underlying control already exists and the `XVT_Control::Init` member function should be used instead.

`Init( boundary, flags = 0L )`
: Creates a scrollbar with the given boundary and attribute flags.

Equivalent C Function

`create_control()`

`create_def_control()`

XVT_ScrollBar::SetScrollPosition

SET A SCROLLBAR'S THUMB POSITION

Prototypes

```
void
SetScrollPosition(
        long                    pos )
```

Parameters

`pos`
The new thumb position. If the new position is outside of the current range, it will be constrained to be in that range.

Description

Sets a scrollbar's thumb position.

This is the only way to change the thumb position. It will not happen automatically.

Implementation Notes

XVT/CH
Because possible thumb positions are limited to a very small number of characters, it is usual to have many values for `pos` map into identical thumb positions.

Equivalent C Function

`set_scroll_pos()`

XVT_ScrollBar::SetScrollProportion

SET THE SIZE OF A SCROLLBAR'S THUMB

Prototypes

```
void
SetScrollProportion(
        long                    prop )
```

Parameters

`prop`
A value between 0 and the extent of the current scrollbar range (max - min). If the value is not in this range, it will be constrained.

Description

This function sets the thumb proportion of a scrollbar. Conceptually, the thumb proportion is the part of a document or drawing that is visible in the viewable area, compared to the total size of the document. The word "proportion" is a bit misleading; it should be thought of as a sub-range.

The usable range of the scrollbar decreases by the size of the scroll proportion. In general, if the range is set to *(range_min, range_max)*, and the proportion is set to *proportion*, then the range of possible scrollbar positions will be from *range_min* to *(range_max — proportion)*.

For example, if the range were set to (–100, 100), and the proportion were set to 50, then the range of possible scrollbar positions would be (–100, 50).

Implementation Notes

XVT/CH, XVT/Mac
Proportional thumbs are not supported.

Equivalent C Function

`set_scroll_proportion()`

XVT_ScrollBar::SetScrollRange

SET A SCROLLBAR'S RANGE

Prototypes

```
void
SetScrollRange(
        long                    min,
        long                    max,
        long                    pos )
```

Parameters

`min`
The lower bound of the new scrollbar range.

`max`
The upper bound of the new scrollbar range.

`pos`
The new thumb position. If the new position is outside of the new range, it will be constrained to be in that range.

Description

Sets a scrollbar's range and a new thumb position in that range.

Equivalent C Function

```
set_scroll_range()
```

Implementation Members

```
virtual BOOLEAN Init( XVT_ControlEntry* ctl_def )
ScrollProtocol
InitUpperLimit
InitLowerLimit
```

Inherited Member Functions

From XVT_Control

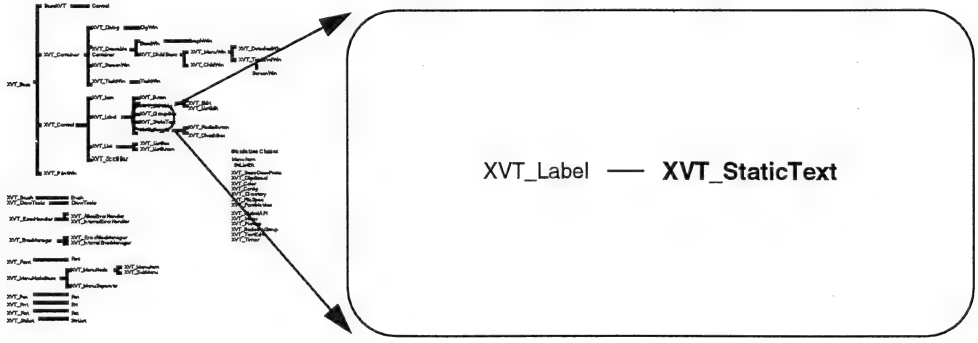
page 92 `virtual void Close()`
page 93 `virtual void e_create()`
page 93 `virtual void e_destroy()`
page 94 `virtual long e_user( long id, void *data )`
page 95 `BOOLEAN GetEnabledState()`
page 95 `long GetID( void )`
page 95 `XVT_Base *GetParent( void )`
page 96 `BOOLEAN GetVisibleState()`
page 96 `void Init()`
page 96 `void MakeFront()`
page 97 `void SetEnabledState( BOOLEAN state )`
page 98 `void SetInnerRect( XVT_Rct boundary )`
page 98 `void SetVisibleState( BOOLEAN state )`

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`
page 10 `virtual DlgWin* CastToDlgWin()`
page 10 `virtual ScreenWin* CastToScreenWin11()`

page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_StaticText



Overview

Header File	`static.h`
Source File	
Superclass	`XVT_Label`
Subclasses	
Usage	Concrete

This class defines the interface to static text controls.

Since static text controls have no event handler member functions (and hence receive no events), there is no need to subclass `XVT_StaticText`. You may instantiate it directly.

Static text controls allow an application to display a text string font in windows or dialogs. The string is clipped to the bounding rectangle of the static text control. The native system determines the font and size of the text.

Constructors

```
XVT_StaticText( XVT_Dialog* parent, long cid )
XVT_StaticText( XVT_DrawableContainer* parent, long cid )
```

Inherited Member Functions

From XVT_Label

page 239 void GetTitle(char* str, unsigned long* len)

page 239 virtual BOOLEAN Init(XVT_Rct boundary, long = 0L, char * = NULL)

page 240 void SetTitle(char* str)

From XVT_Control

page 92 virtual void Close()

page 93 virtual void e_create()

page 93 virtual void e_destroy()

page 94 virtual long e_user(long id, void *data)

page 95 BOOLEAN GetEnabledState()

page 95 long GetID(void)

page 95 XVT_Base *GetParent(void)

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

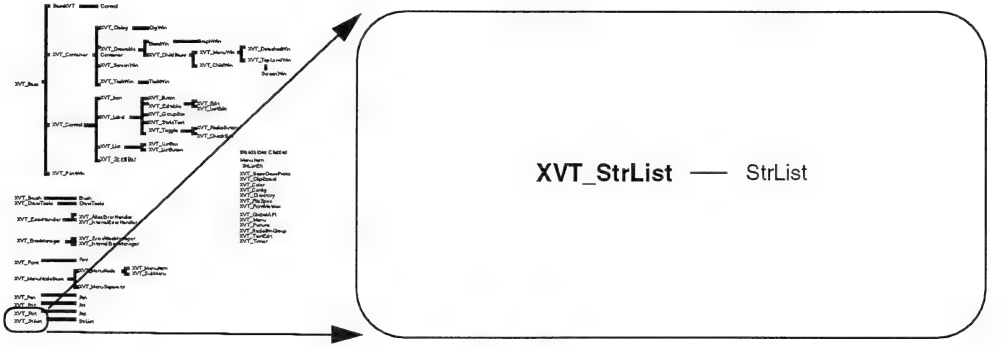
page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_StrList



Overview

Header File	`strlist.h`
Source File	`strlist.cc`
Superclass	
Subclasses	`StrList`
Usage	Concrete

The `XVT_StrList` class specifies the interface to general-purpose lists of strings. Each entry in a list consists of a string and a `long` data element.

XVT++ uses string lists wherever there is a need to represent a list of strings.

Constructors

```
XVT_StrList( SLIST list = NULL )
XVT_StrList( const XVT_StrList& list )
~XVT_StrList()
```

Operators

```
XVT_StrList& operator=( const XVT_StrList& list )
BOOLEAN operator==( const XVT_StrList& list )
BOOLEAN operator != ( const XVT_StrList& list )
```

Member Functions

XVT_StrList::Add

ADD AN ITEM OR ITEMS TO A STRING LIST

Prototypes

```
void
Add(
        long                    element,
        const char*             str,
        long                    data = 0L )

void
Add(
        const char*             str,
        long                    data = 0L )

void
Add(
        XVT_StrList*            sl )
```

Parameters

`element`
The index of the element before which the element or elements are to be added. The first element is index 0. The last element may be indicated by –1.

`str`
The string portion of the element to be added.

`data`
The data portion of the element to be added.

`sl`
The string list to be added to this.

Description

Adds an item or items to a string list.

`Add( element, str, data )`
Add a single element to this string list.

`Add( element, sl )`
Add all the elements in the string list, `sl`, to this string list.

`Add( str, data )`
Add a single element to the end of this string list.

`Add( sl )`
Add all the elements in the string list, `sl`, to the end of this string list.

Equivalent C Function

`slist_add()`

XVT_StrList::AddSorted

ADD AN ELEMENT TO A STRING LIST IN ORDER

Prototypes

```
void
AddSorted(
        const char*             str,
        long                    data = 0L,
        BOOLEAN                 unique = FALSE,
        BOOLEAN                 case_sensitive = FALSE )
```

Parameters

`str`
The string portion of the element to add.

`data`
The data portion of the element to add.

`unique`
A flag that is `TRUE` if duplicate elements are not to be added to the string list, `FALSE` if they are.

`case_sensitive`
A flag that is `TRUE` if element comparisons are to be case-sensitive, `FALSE` if they are to ignore case.

Description

Adds an element to a string list in lexicographic order.

Equivalent C Function

```
slist_add_sorted()
```

XVT_StrList::Count

RETRIEVE THE NUMBER OF ELEMENTS IN A STRING LIST

Prototypes

```
long
Count()
```

Return Value

The number of elements in a string list.

Equivalent C Function

```
slist_count()
```

XVT_StrList::Debug

APPEND A DUMP OF A STRING LIST TO THE DEBUG FILE

Prototypes

```
void
Debug()
```

Description

Appends a dump of a string list to the debug file.

Equivalent C Function

```
slist_dbg()
```

XVT_StrList::GetElement

RETRIEVE AN ELEMENT FROM A STRING LIST

Prototypes

```
void
GetElement(
        long                    index,
        const char**            str,
        long*                   data ) const
```

Parameters

`index`
: The index of the element to retrieve. A –1 indicates that the last item in the list is to be retrieved.

`str`
: Storage for a string pointer that will be set to point to the string in the element.

`data`
: Storage to receive the data associated with the element.

Return Value

`TRUE` if the element was found, `FALSE` if `index` was out of range.

Description

Retrieves an element from a string list. If `index` is invalid, an XVT++ internal error is generated.

Equivalent C Function

`slist_elt()`

XVT_StrList::GetFirst

START A TRAVERSAL OF A STRING LIST

Prototypes

```
void
GetFirst(
        const char**            str,
        long*                   data )
```

Parameters

`str`
Storage for a string pointer that will be set to point to the string in the element.

`data`
Storage to receive the data associated with the element.

Return Value

`TRUE` if the element was found, `FALSE` if `index` was out of range.

Description

Retrieves the first element and sets the traversal context such that subsequent calls to `Next` will retrieve the second through the `Nth` elements. If the list is empty, sets `str` to `NULL`.

Equivalent C Function

`slist_first()`

XVT_StrList::GetNext

RETRIEVE THE NEXT ELEMENT IN A STRING LIST

Prototypes

```
void
GetNext(
        const char**        str,
        long*               data )
```

Parameters

`str`
Storage for a string pointer that will be set to point to the string in the element.

`data`
Storage to receive the data associated with the element.

Return Value

A flag that is `TRUE` if there was an element, `FALSE` if the end of the list was reached.

Description

Retrieves subsequent elements of a string list. If the end of the list has been reached, sets `str` to `NULL`.

Equivalent C Function

`slist_next()`

XVT_StrList::Remove

REMOVE AN ELEMENT FROM A STRING LIST

Prototypes

```
void
Remove(
        long                    index )
```

Parameters

`index`
The index of the element to remove. A –1 indicates that the last item in the list is to be removed. Out of range indexes generate an XVT++ internal error.

Description

Removes an element from a string list.

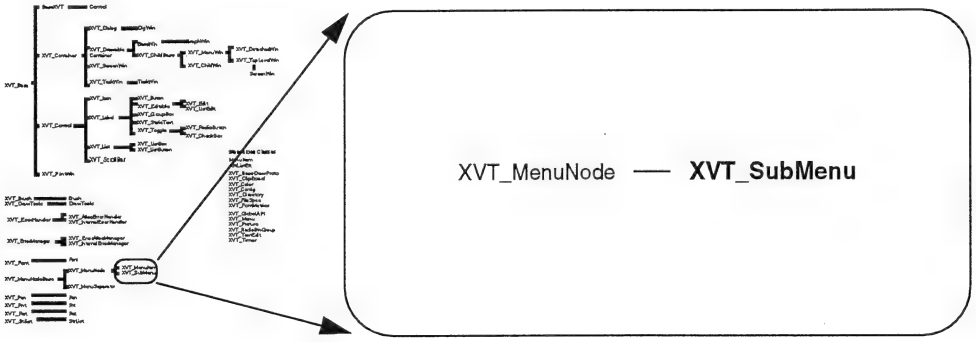
Equivalent C Function

`slist_rem()`

Implementation Members

`GetList`
`SetList`
`List`
`CurrentElt`
`CopyList`
`FindElement`
`IsValid`

XVT_SubMenu



Overview

Header File	`menu.h`
Source File	`menu.cc`
Superclass	`XVT_MenuNode`
Subclasses	
Usage	Concrete

Instances of this class represent submenus in the menu hierarchy. A submenu simply references an instance of `XVT_Menu`, which is the actual submenu.

Example

See the example in the description of the `XVT_Menu` class.

Constructors

```
XVT_SubMenu(
    XVT_Menu* child,
    MENU_TAG tag = 0,
    BOOLEAN enabled = TRUE,
    const char* text = NULL,
    short mkey = 0 )
XVT_SubMenu( XVT_SubMenu& submenu )
~XVT_SubMenu()
```

Member Functions

XVT_SubMenu::GetSubMenuPtr

RETRIEVE THE SUBMENU POINTER

Prototypes

```
XVT_Menu*
GetSubMenuPtr() const
```

Return Value

A pointer to the menu that is the actual submenu.

XVT_SubMenu::SetSubMenuPtr

SET THE SUBMENU POINTER

Prototypes

```
void
SetSubMenuPtr(
        XVT_Menu*               submenu )
```

Parameters

submenu
The submenu.

Description

Sets the reference to the submenu. There is nothing special about the referenced menu object other than that it is referenced by a submenu.

Implementation Members

```
ConvertTo
XVT_SubMenu( MENU_ITEM* mip )
SetOwner
SubMenuPtr
```

Inherited Member Functions

From XVT_MenuNode

page 278 BOOLEAN GetEnabledState()

page 278 short GetMKey()

page 278 void GetTitle(char *buffer, long len)

page 279 void SetEnabledState(BOOLEAN state)

page 279 void SetTitle(char *str)

From XVT_MenuNodeBase

page 281 virtual XVT_MenuItem *CastToMenuItem()

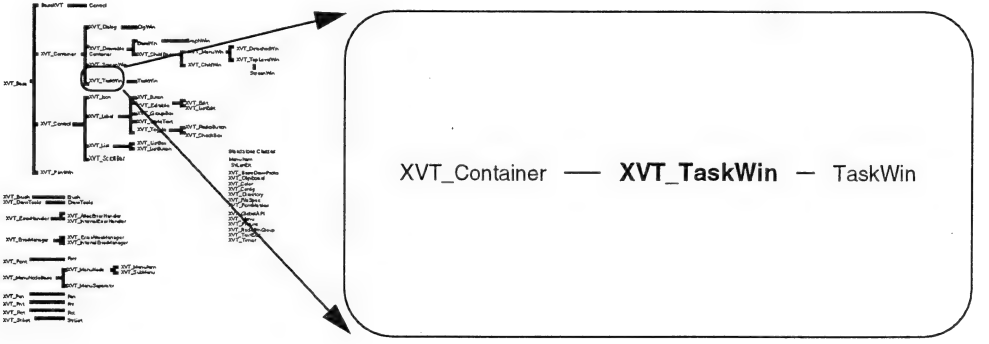
page 281 virtual XVT_MenuNode *CastToMenuNode()

page 281 virtual XVT_MenuSeparator *CastToMenuSeparator()

page 281 virtual XVT_SubMenu *CastToSubMenu()

page 282 XVT_Menu *GetParent()

XVT_TaskWin



Overview

Header File	`taskwin.h`
Source File	`taskwin.cc`
Superclass	`XVT_Container`
Subclasses	`TaskWin`
Usage	Abstract

The `XVT_TaskWin` class specifies the interface to the task window.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Example

Every application must have a task window subclass that overrides at least the e_create member function. The following is an example of a simple task window subclass:

```
class MyTaskWin : public XVT_TaskWin
{
    void e_create();
    void e_close();
}
    .
    .
    .
```

We create a subclass for the quit menu item, which simply closes the task window.

```
class QuitMenuItem : public XVT_MenuItem
{
public:
    QuitMenuItem( XVT_TaskWin *tw ) :
        XVT_MenuItem( M_FILE_QUIT ),
        theTaskWindow(tw);
    void e_action( BOOLEAN, BOOLEAN );

private:
    XVT_TaskWin* theTaskWindow;
};


void
QuitMenuItem::e_action( BOOLEAN, BOOLEAN )
{
    theTaskWindow->Close();
}
```

When the task window is created, we replace the default quit menu item with our subclass.

```
MyTaskWin::e_create()
{
    XVT_MenuItem* theQuitItem =
            new QuitMenuItem( this );
    .
    .
    .

}
```

```
MyTaskWin::e_close()
{
    Close();
}
```

The task window's e_create() function should also create whatever initial windows or dialogs your application requires.

The main function just instantiates our class window subclass:

```
int
main( int argc, char *argv[] )
{
    MyTaskWin *task_win = new MyTaskWin;
    XVT_Config config(
            MENU_BAR_RID,
            0,
            "MyApp",
            "MyApp",
            "MyApp" );

task_win->Init( argc, argv, 0L, config );

    return 0;
}
```

Constructors

```
XVT_TaskWin()
virtual ~XVT_TaskWin()
```

Member Variables

XVT_TaskWin::Menu

A POINTER TO THE WINDOW'S MENU

Declaration

```
protected:

XVT_Menu* Menu;
```

Description

A pointer to the window's menu. Typically, you use this member when replacing default menu items with you own in a window's `e_create` implementation.

Member Functions

The following functions work exactly as for `XVT_DrawableContainer`:

page 136 `virtual void e_size( XVT_Rct boundary )`

page 137 `virtual void e_timer( XVT_Timer* timer )`

page 139 `virtual long e_user( long id, void* data )`

page 141 `EVENT_MASK GetEventMask() const`

page 142 `XVT_ChildBase* GetFirstWin()`

page 143 `XVT_ChildBase* GetNextWin()`

page 143 `long GetWinCount() const`

page 146 `void SetEventMask( EVENT_MASK ask )`

The following functions work exactly as for `XVT_MenuWin`:

page 287 `virtual void e_font( XVT_Font font, FONT_PART part )`

page 287 `XVT_Menu* GetMenu()`

page 288 `BOOLEAN GetTitle( char* buffer, unsigned long* len ) const`

page 289 `void SetFontMenu( XVT_Font font )`

page 290 `void SetMenu( XVT_Menu* menu )`

page 291 `void SetTitle( const char* str )`

XVT_TaskWin::Close

SCHEDULE AN APPLICATION'S TERMINATION

Prototypes

```
void
Close()
```

Description

Schedules an application's termination. At some time after making this call, the `e_destroy` function is called to indicate that the application is terminating.

Equivalent C Function

```
close_window()
xvt_terminate()
```

XVT_TaskWin::e_close

RECEIVE NOTIFICATION OF A CLOSE REQUEST

Prototypes

```
virtual void
e_close()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to close requests.

Typically this function is called in response to the user operating the close control on the task window. Your implementation should save and close all documents and then schedule the termination of the application by calling `Close`.

XVT_TaskWin::e_create

RECEIVE NOTIFICATION OF APPLICATION CREATION

Prototypes

```
virtual void
e_create()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to application creation.

Your implementation should initialize your application data structures and create whatever initial windows and dialogs are required by your application.

XVT_TaskWin::e_destroy

RECEIVE NOTIFICATION OF IMMINENT APPLICATION EXIT

Prototypes

```
virtual void
e_destroy()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to application termination.

This is the last time your application receives control. At this point, all of the XVT++ interface is inoperable. You cannot (and need not) create or destroy windows or controls. You should, however, release any resources (locks, etc.) allocated by your application.

XVT_TaskWin::e_quit

RECEIVE NOTIFICATION OF A QUIT REQUEST

Prototypes

```
virtual void
e_quit(
        BOOLEAN                 query )
```

Parameters

`query`
A flag that is `TRUE` if the application should prepare itself to quit, and `FALSE` if the application should quit immediately by closing the task window.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to quit requests.

This function is called when the user or the system wants the application to quit, or at least to consider quitting.

If your application has a Quit or Exit item on a menu (File menu, usually), this function is not called when the user chooses that item—a call to the appropriate `e_action` member is made as usual. This function is reserved for those cases where the native GUI system has the ability to tell applications that the system is performing a system-wide shutdown; it is not an event that the user can directly generate.

There are two things that should be done in an `e_quit` implementation:

`query` is `TRUE`:

The application should not actually quit, but should prepare to quit. Usually, if there are any unsaved documents, the application will have to query the user about each via a dialog box containing three buttons: Save, Discard, and Cancel. The application should do the following in each case:

Save

Save the document and, if that is successful, close the window and go on to the next document's save dialog.

Discard

Don't save the document, but just close the window and go on to the next document's save dialog.

Cancel

Return from the event handler without showing any more save dialogs. XVT will understand that quitting is not okay.

After the user has been queried about every unsaved document, and has not clicked the Cancel button for any of them, the application should call `QuitOK` and then return from this function to tell XVT++ that the application is willing to quit. However, it shouldn't actually quit because other applications may have to be queried also, and one of them might decline to quit.

`query` is `FALSE`:

The application was previously queried with an `e_quit(TRUE)`, and it has already determined that quitting is okay. It should immediately call the task window's `Close`. No documents have to be saved because they were taken care of earlier.

Remember that `e_quit` is different from `e_close`. The `e_quit` event is not called when the user attempts to close the task window, or any other window or dialog. In those cases, `e_close` is called.

Implementation Notes

This call is generated only by XVT/Win and XVT/PM.

XVT_TaskWin::Init

INITIALIZE THE TASK WINDOW

Prototypes

```
virtual void
Init(
        int                     argc,
        char*                   argv[],
        unsigned long           flags,
        XVT_Config              config )
```

Parameters

`argc`
The value of `argc` as passed into `main`.

`argv`
The value of `argv` as passed into `main`.

`flags`
Attribute flags governing the task window. This parameter is currently unused.

`config`
The `config` structure that defines the appearance of the task window and provides application-wide parameters to XVT++.

Return Value

This call never returns.

Description

This is the entry point into XVT++. Your entire application will run below this function call.

Equivalent C Function

`xvt_system()`

XVT_TaskWin::QuitOK

INDICATE THAT THE APPLICATION CAN QUIT

Prototypes

```
void
QuitOK()
```

Return Value

None.

Description

This member function is used on systems where the native GUI has the ability to tell applications that the system is performing a system-wide shutdown. Its purpose is to tell XVT that the application is willing to quit. Your application will call `QuitOK` from within the `e_quit` member function of the task window, typically after it has given the user the chance to save work and confirm that it is okay to quit.

Here is an example:

```
class MyTaskWin : public XVT_TaskWin
{
public:
    void e_quit( BOOLEAN query );

protected:
    BOOLEAN SaveAllDocuments();

};

void MyTaskWin::e_quit( BOOLEAN query )
{
    if (query)
    {
        if (SaveAllDocuments())
            QuitOK();
    }
    else
        Close();
}
```

Implementation Members

```
Install
RemoveWin
GetMenuNode
Created
AllocErrorHandler
InternalErrorHandler
TitleProtocol
CloseProtocol
MenuBarID
CommandEvent
```

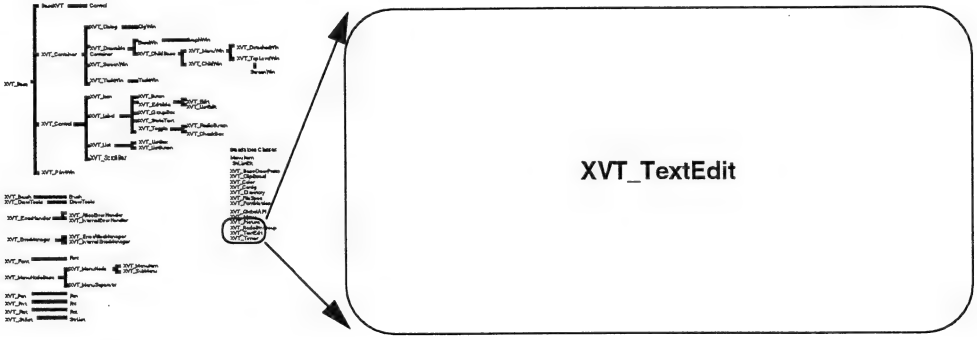
Inherited Member Functions

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_TextEdit



Overview

Header File	`textedit.h`
Source File	`textedit.cc`
Superclass	
Subclasses	
Usage	Concrete

A Text Edit *object* consists of text divided into *paragraphs*, each terminated with a carriage return. If word-wrapping is enabled, each paragraph can appear as one or more *lines* of text.

The length of a line and the total number of lines can be very large, so normally not all of the text appears on the screen. Only the part within the view rectangle can be seen. The application program or the user can scroll the text so that the unseen part enters the view rectangle.

Optionally, you can request the Text Edit system to draw a *border* rectangle around the view rectangle. If so, the view rectangle is inset by 4 pixels inside the border rectangle. On the bottom it may be inset by a few more pixels, because the bottom coordinate of the view

rectangle you request may be reduced so that an integral number of text lines will appear.

Note that in XVT++ text edit objects automatically create a borderless child window to contain them.

Constructors

```
XVT_TextEdit( XVT_ChildBase* parent)
virtual ~XVT_TextEdit()
```

Member Functions

XVT_TextEdit::Activity

DETERMINE IF THERE HAS BEEN ANY USER ACTIVITY IN A TEXT EDIT

Prototypes

```
BOOLEAN
Activity()
```

Return Value

A flag that is TRUE if the user has operated the text edit since the previous call to Activity, FALSE if not.

XVT_TextEdit::AddPar

ADD A NEW PARAGRAPH TO A TEXT EDIT OBJECT

Prototypes

```
BOOLEAN
AddPar(
        T_PNUM                  t,
        char*                   ch )
```

Return Value

TRUE if successful, FALSE if not.

Parameters

t
: The paragraph before which to add the new paragraph. The first paragraph is 0.

ch
: A null-terminated string that gives the contents of the new paragraph.

Description

Adds a new paragraph to a text edit object.

Equivalent C Function

`tx_add_par()`

XVT_TextEdit::Append

APPEND A STRING TO A PARAGRAPH

Prototypes

```
BOOLEAN
Append(
        T_PNUM                  t,
        const char*             ch )
```

Return Value

`TRUE` if successful, `FALSE` if not.

Parameters

t
: The paragraph upon which to append the string. The first paragraph is 0.

ch
: The text to append to the paragraph.

Description

Appends a string to a paragraph.

Equivalent C Function

`tx_append()`

XVT_TextEdit::Clear

REMOVE ALL TEXT FROM A TEXT EDIT OBJECT

Prototypes

```
BOOLEAN
Clear()
```

Return Value

TRUE if successful, FALSE if not.

Description

Removes all text from a text edit object.

Equivalent C Function

```
tx_clear()
```

XVT_TextEdit::Close

SCHEDULE THIS TEXT EDIT FOR DESTRUCTION

Prototypes

```
void
Close()
```

Description

Schedules this text edit for destruction.

Equivalent C Function

```
tx_destroy()
```

XVT_TextEdit::DelPar

DELETE A PARAGRAPH

Prototypes

```
BOOLEAN
DelPar(
        T_PNUM                  t )
```

Parameters

t
The paragraph to be deleted. The first paragraph is 0. If t is out of range the operation will be ignored.

Return Value

TRUE if successful, FALSE if not.

Description

Deletes a paragraph.

Equivalent C Function

tx_del_par()

XVT_TextEdit::DoHscroll

SCROLL A TEXT EDIT HORIZONTALLY

Prototypes

```
void
DoHscroll(
        long                    x )
```

Parameters

x
The number of pixels to scroll by.

Description

Scrolls a text edit horizontally.

Equivalent C Function

tx_hscroll()

XVT_TextEdit::DoVscroll

SCROLL A TEXT EDIT OBJECT VERTICALLY

Prototypes

```
void
DoVscroll(
        long                    l )
```

Parameters

`l`
The number of lines to scroll.

Description

Scrolls a text edit object vertically.

Equivalent C Function

`tx_vscroll()`

XVT_TextEdit::GetAttrib

RETRIEVE A TEXT EDIT OBJECT'S ATTRIBUTES

Prototypes

```
unsigned long
GetAttrib() const
```

Return Value

The text edit object's current attributes.

Equivalent C Function

`tx_get_attrib() const`

XVT_TextEdit::GetBorder

RETRIEVE A TEXT EDIT'S BORDER RECTANGLE

Prototypes

```
XVT_Rct
GetBorder() const
```

Return Value

The text edit's border rectangle.

Equivalent C Function

`tx_get_border()`

XVT_TextEdit::GetFont

RETRIEVE A TEXT EDIT OBJECT'S FONT

Prototypes

```
XVT_Font
GetFont() const
```

Return Value

The text edit object's current font.

Equivalent C Function

```
tx_get_font()
```

XVT_TextEdit::GetLimit

RETRIEVE A TEXT EDIT OBJECT'S CHARACTER LIMIT

Prototypes

```
long
GetLimit() const
```

Return Value

The maximum number of characters allowed in the text edit object. This number is meaningful only if `TX_ONEPAR` is set.

Equivalent C Function

```
tx_get_limit()
```

XVT_TextEdit::GetLine

GET THE CONTENTS OF A LINE

Prototypes

```
BOOLEAN
GetLine(
        char*               buffer
        T_PNUM,             paragraph
        T_LNUM,             line
        unsigned long*      len ) const
```

Parameters

`buffer`
Storage to receive the line's contents.

`paragraph`
The index of the paragraph.

`line`
The index of the line in the paragraph.

`len`
The length of the returned string.

Return Value

A flag indicating whether the user-supplied buffer was long enough to store the entire text line. This flag is `FALSE` if the buffer was not long enough, in which case the correct length is returned via the `len` parameter. Otherwise the flag is `TRUE`.

Description

Gets the contents of a line.

Equivalent C Function

`tx_get_line()`

XVT_TextEdit::GetMargin

GET THE TEXT EDIT OBJECT'S MARGIN

Prototypes

```
long
GetMargin() const
```

Return Value

The current margin in pixels.

Equivalent C Function

`tx_get_margin()`

XVT_TextEdit::GetNumChars

RETRIEVE THE NUMBER OF CHARACTERS IN A TEXT EDIT LINE

Prototypes

```
T_CNUM
GetNumChars(
        T_PNUM                  p,
        T_LNUM                  l ) const
```

Parameters

`p`
The index of the paragraph.

`l`
The index of the line in the paragraph.

Return Value

The number of characters in the given line.

Equivalent C Function

`tx_get_num_chars()`

XVT_TextEdit::GetNumLines

RETRIEVE THE NUMBER OF LINES IN THE TEXT EDIT OBJECT

Prototypes

```
T_LNUM
GetNumLines() const
```

Return Value

The number of lines in the text edit object.

Equivalent C Function

`tx_get_num_lines()`

XVT_TextEdit::GetNumParLines

RETRIEVE THE NUMBER OF LINES IN A TEXT EDIT PARAGRAPH

Prototypes

```
T_LNUM
GetNumParLines(
        T_PNUM                  t ) const
```

Parameters

t
The index of the paragraph.

Return Value

The number of lines in the paragraph.

Equivalent C Function

```
tx_get_num_par_lines()
```

XVT_TextEdit::GetNumPars

RETRIEVE THE NUMBER OF PARAGRAPHS IN A TEXT EDIT OBJECT

Prototypes

```
T_PNUM
GetNumPars() const
```

Return Value

The number of paragraphs in the text edit object.

Equivalent C Function

```
tx_get_num_pars()
```

XVT_TextEdit::GetOrigin

RETRIEVE THE OFFSET TO THE CURRENT VIEW RECTANGLE

Prototypes

```
void
GetOrigin(
        T_PNUM*             p,
        T_LNUM*             l1,
        T_LNUM*             l2,
        T_CPOS*             cp ) const
```

Parameters

`p`
The paragraph number.

`l1`
The line number relative to `p`.

`l2`
The line number relative to the beginning of the text edit object.

`cp`
The pixel offset relative to the left margin.

Description

Retrieves various offsets describing the location of the current view rectangle.

Equivalent C Function

```
tx_get_origin()
```

XVT_TextEdit::GetSel

RETRIEVE THE CURRENT TEXT EDIT SELECTION

Prototypes

```
void
GetSel(
        T_PNUM*             p1,
        T_LNUM*             l1,
        T_CNUM*             c1,
        T_PNUM*             p2,
        T_LNUM*             l2,
        T_CNUM*             c2 ) const
```

Parameters

`p1`
The starting paragraph number.

`l1`
The starting line number.

`c1`
The starting character number.

`p2`
The ending paragraph number.

`l2`
The ending line number.

`c2`
The ending character number.

Description

Retrieves the current selection. If the current selection is empty, then it will be the case that `(p1 == p2) && (l1 == l2) && (c1 ==c2)`.

Equivalent C Function

```
tx_get_sel()
```

XVT_TextEdit::GetView

RETRIEVE THE VIEW RECTANGLE

Prototypes

```
XVT_Rct
GetView() const
```

Return Value

The view rectangle.

Equivalent C Function

```
tx_get_view()
```

XVT_TextEdit::Init

CREATE THE UNDERLYING TEXT EDIT OBJECT

Prototypes

```
BOOLEAN
Init(
        XVT_Rct             boundary,
        unsigned short      attrib,
        XVT_Font            font,
        short               margin,
        short               limit )
```

Parameters

`boundary`
The bounding rectangle of the new text edit object.

`attrib`
The initial text edit attributes, a bitwise OR'd combination of flags. Valid attribute flags are:

`TX_AUTOHSCROLL`
If set, enables automatic scrolling in the horizontal direction.

`TX_AUTOVSCROLL`
If set, enables automatic scrolling in the vertical direction.

`TX_BORDER`
If set, causes the text edit object to draw a rectangular border.

`TX_ENABLECLEAR`
If set, leaves the clear item in the edit menu enabled.

`TX_NOCOPY`
If set, disables the copy item in the edit menu.

`TX_NOCUT`
If set, disables the cut item in the edit menu.

`TX_NOMENU`
If set disables all interaction with the edit menu.

`TX_NOPASTE`
If set, disables the paste item in the edit menu.

`TX_ONEPAR`
If set, limits the text edit object to a single paragraph.

`TX_OVERTYPE`
If set, causes new characters to overwrite old rather than inserting themselves.

TX_READONLY
: If set, makes the text edit object read-only. Users can scroll the text but cannot modify it.

TX_WRAP
: If set, causes text edit to wrap lines that will not fit in the text edit.

TX_VSCROLLBAR
: If set, causes the text edit to have a vertical scrollbar.

TX_HSCROLLBAR
: If set, causes the text edit to have a horizontal scrollbar.

`font`
: The font to be used to render the text inside the text edit object.

`margin`
: The right margin in pixels. This value is meaningful only if the TX_WRAP attribute is set.

`limit`
: The limit on the number of characters in the text edit object. This value is meaningful only if the TX_ONEPAR attribute is set.

Return Value

TRUE if the text edit was successfully created, FALSE otherwise. A FALSE return value means that the native system ran out of some resource that is consumed by windows. Recovery can be attempted by disposing of the new text edit, closing another window or text edit object, and retrying the creation of the text edit object.

Description

The `Init` member functions create the underlying text edit object.

`Init( boundary, attrib, font, margin, limit )`
: Create a text edit object as specified by the given parameters.

Equivalent C Function

`tx_create()`

`create_def_tx()`

XVT_TextEdit::Reset

RESET A TEXT EDIT OBJECT

Prototypes

```
void
Reset()
```

Description

Resets a text edit object. Any selected text is unselected, the caret is positioned before the first character, the text is scrolled as far up and to the left as possible, all paragraphs are rewrapped, and an update event for the border rectangle is enqueued.

Equivalent C Function

```
tx_reset()
```

XVT_TextEdit::Resume

RESUME SCREEN UPDATES

Prototypes

```
void
Resume()
```

Description

Resumes screen updates. Cancels a previous call to `Suspend`.

Equivalent C Function

```
tx_resume()
```

XVT_TextEdit::SetActive

MAKE THIS TEXT EDIT BE ACTIVE

Prototypes

```
void
SetActive()
```

Description

Makes this text edit active. The active text edit has keyboard focus. Calling this function causes whatever window currently has focus to lose it.

Equivalent C Function

```
tx_set_active()
```

XVT_TextEdit::SetAttrib

SET A TEXT EDIT'S ATTRIBUTES

Prototypes

```
void
SetAttrib(
        unsigned long           attrib )
```

Parameters

`attrib`
The new text edit attributes. See `Init` for details.

Description

Sets a text edit's attributes.

Equivalent C Function

```
tx_set_attrib()
```

XVT_TextEdit::SetBorder

SET A TEXT EDIT OBJECT'S BORDER RECTANGLE

Prototypes

```
void
SetBorder(
        XVT_Rct                 boundary )
```

Parameters

`boundary`
The new border rectangle.

Description

Sets a text edit object's border rectangle.

Equivalent C Function

```
tx_set_border()
```

XVT_TextEdit::SetColors

SET TEXT EDIT OBJECT COLORS

Prototypes

```
void
SetColors(
        XVT_Color               text,
        XVT_Color               border,
        XVT_Color               background )
```

Parameters

`text`
The text foreground color.

`border`
The text border foreground color.

`background`
The background color.

Description

Sets text edit object colors.

Equivalent C Function

```
tx_set_colors()
```

XVT_TextEdit::SetFont

SET A TEXT OBJECT'S FONT

Prototypes

```
void
SetFont(
        XVT_Font                f )
```

Parameters

f
The new font.

Description

Sets a text object's font.

Equivalent C Function

tx_set_font()

XVT_TextEdit::SetLimit

SET A TEXT EDIT OBJECT'S CHARACTER LIMIT

Prototypes

```
void
SetLimit(
        long                    l )
```

Parameters

l
The new character limit.

Description

Sets a text edit object's character limit.

Equivalent C Function

tx_set_limit()

XVT_TextEdit::SetMargin

SET A TEXT EDIT OBJECT'S MARGIN

Prototypes

```
void
SetMargin(
        long                    margin )
```

Parameters

margin
The new margin.

Description

Sets a text edit object's margin.

Equivalent C Function

```
tx_set_margin()
```

XVT_TextEdit::SetPar

REPLACE A PARAGRAPH

Prototypes

```
BOOLEAN
SetPar(
        T_PNUM,                 t
        const char*             ch )
```

Parameters

`t`
The index of the paragraph to be replaced.

`ch`
The contents of the replacement paragraph.

Description

Replaces a paragraph.

Equivalent C Function

```
tx_set_par()
```

XVT_TextEdit::SetSel

SET THE TEXT EDIT OBJECT'S SELECTION

Prototypes

```
void
SetSel(
        T_PNUM                  p1,
        T_LNUM                  l1,
        T_CNUM                  c1,
        T_PNUM                  p2,
        T_LNUM                  l2,
        T_CNUM                  c2)
```

Parameters

p1
: The starting paragraph number.

l1
: The starting line number.

c1
: The starting character number.

p2
: The ending paragraph number.

l2
: The ending line number.

c2
: The ending character number.

Description

Sets the text edit object's selection.

Equivalent C Function

```
tx_set_sel()
```

XVT_TextEdit::Suspend

SUSPEND SCREEN UPDATES

Prototypes

```
void
Suspend()
```

Description

Suspends screen updates until the next call to `Resume`.

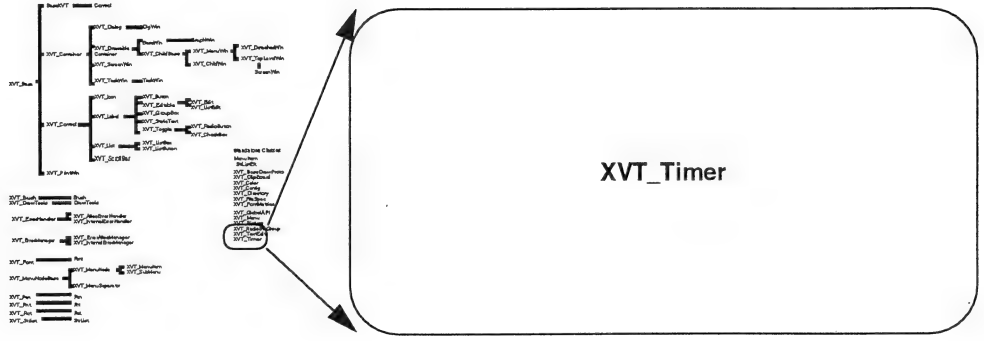
Equivalent C Function

```
tx_suspend()
```

Implementation Members

```
BOOLEAN Init( XVT_TextEditEntry* tx_def )
GetLinesInView
GetID
ID
Parent
Enclosure
```

XVT_Timer



Overview

Header File	`timer.h`
Source File	`timer.cc`
Superclass	
Subclasses	
Usage	Concrete

Instances of the `XVT_Timer` class handle the creation and destruction of timers. Basically, a timer is started when an instance of this class is created and destroyed when the instance is deleted. As long as the timer object exists, the target object's `e_timer` member function is called at the given interval.

XVT++ guarantees that timer intervals of one second or greater will be honored in all environments. However, timer intervals of less than one second are *not* portable.

Example

In the action code for a button, this example starts a timer for the parent window with a 5-second interval:

```
MyButton::e_action()
{
    new XVT_Timer(
        (XVT_DrawableContainer*)GetParent(),
        5000 );
        .
        .
        .

}
```

Casting the result of `GetParent` is okay as long as the `MyButton` implementation always knows a-priori that its parent will be a subclass of `XVT_DrawableContainer`. If this is not the case, the button subclass should include constructors which retain a properly typed pointer to the parent object.

```
MyWindow::e_timer( XVT_timer *timer )
{
    delete timer;
        .
        .
        .
}
```

In the parent window's `e_timer` implementation, we delete the timer and do whatever it was that we wanted to delay for five seconds.

Constructors

`XVT_Timer( XVT_TaskWin* target, long interval )`

`XVT_Timer( XVT_DrawableContainer* target, long interval )`

`XVT_Timer( XVT_Dialog* target, long interval )`
Create a timer in a task window, window or dialog. The interval is given in milliseconds. All are essentially equivalent to `create_timer`.

`~XVT_Timer()`
Dispose of a timer. Equivalent to `kill_timer`.

Member Functions

XVT_Timer::GetInterval

RETRIEVE A TIMER'S INTERVAL

Prototypes

```
long
GetInterval() const
```

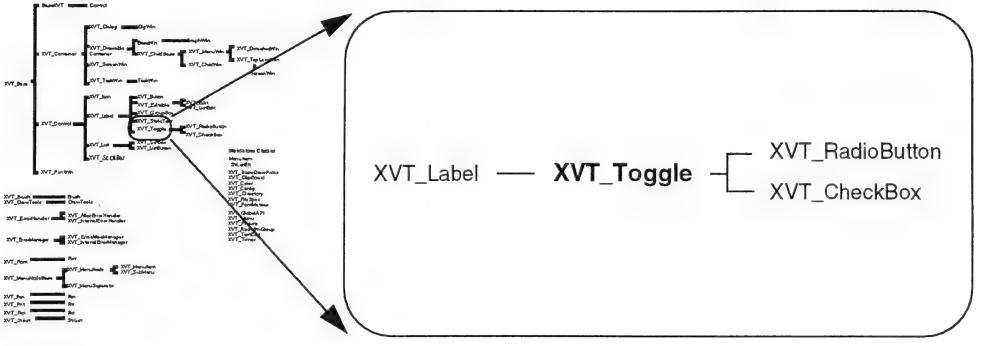
Return Value

The timer's interval.

Implementation Members

```
GetID
GetTarget
ID
Interval
Target
DoInit
```

XVT_Toggle



Overview

Header File	`toggle.h`
Source File	`toggle.cc`
Superclass	`XVT_Label`
Subclasses	`XVT_CheckBox`, `XVT_RadioButton`
Usage	Implementation

The `XVT_Toggle` class defines the interface common to all two-state (toggle) controls.

Member Functions

XVT_Toggle::e_action

RECEIVE NOTIFICATION THAT A TOGGLE CONTROL HAS BEEN OPERATED

Prototypes

```
virtual void
e_action()
```

Description

This member function is called when a toggle has been operated (toggled). The default version does nothing. Your subclass should provide a definition for this function, which does whatever you want to do when a toggle is pressed.

Typically, applications check the toggle using one of the `Set_Checked_State` member functions provided by subclasses.

XVT_Toggle::GetCheckedState

RETRIEVE THE TOGGLE CONTROL'S STATE

Prototypes

```
BOOLEAN
GetCheckedState() const
```

Return Value

A flag that is `TRUE` if the toggle is in a non-default state, or `FALSE` if it is in a default state.

Implementation Members

`CheckProtocol`

Inherited Member Functions

From XVT_Label

page 239 void GetTitle(char* str, unsigned long* len)

page 239 virtual BOOLEAN Init(XVT_Rct boundary, long = 0L, char * = NULL)

page 240 void SetTitle(char* str)

From XVT_Control

page 92 virtual void Close()

page 93 virtual void e_create()

page 93 virtual void e_destroy()

page 94 virtual long e_user(long id, void *data)

page 95 BOOLEAN GetEnabledState()

page 95 long GetID(void)

page 95 XVT_Base *GetParent(void)

page 96 BOOLEAN GetVisibleState()

page 96 void Init()

page 96 void MakeFront()

page 97 void SetEnabledState(BOOLEAN state)

page 98 void SetInnerRect(XVT_Rct boundary)

page 98 void SetVisibleState(BOOLEAN state)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

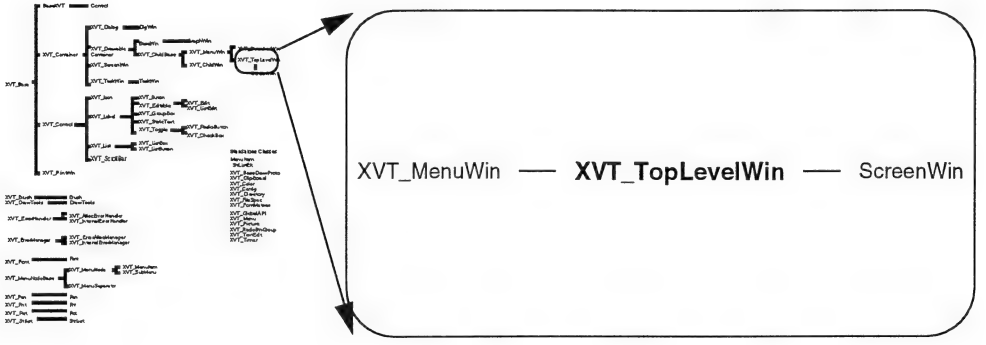
page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()
page 13 virtual XVT_Rct GetOuterRect()

XVT_TopLevelWin



Overview

Header File	`toplevel.h`
Source File	`toplevel.cc`
Superclass	`XVT_MenuWin`
Subclasses	`ScreenWin`
Usage	Abstract

The `XVT_TopLevelWin` class specifies the interface to the class of windows that may contain controls or child windows and that are contained by the task window if the native window system has a task window.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Example

Most applications will have at least one top-level window subclass. The following declaration is typical:

```
class MyTopLevelWin : public XVT_TopLevelWin
{
public:
    MyTopLevelWin();
    ~MyTopLevelWin();

    void e_create();
    void e_destroy();
    void
    e_char(
        short chr,
        BOOLEAN shift,
        BOOLEAN control );

private:
    struct MyWindowData
    {
        XVT_TopLevelWin* secondaryView;
        long foo;
        // other data associated with this window...
    }   Data;
};
```

The subclass overrides some event handling member functions and adds some window-specific data in a substructure. Among the window data is a pointer to another top level window, `secondaryView`, which provides a functionality related to this window.

The example supposes that this window is being created from a resource that defines not only the window but its menubar and contained controls as well. The window is created, presumably in the task window's `e_create` function, by code that looks like this:

```
{
    XVT_TopLevelWin *newWin;
    .
    .
    .

    newWin = new MyTopLevelWin;
    newWin->Init( MY_WIN_RID );
    .
    .
    .

}
```

The implementation constructors and destructors typically just initialize instance data structures. Operations on other GUI objects, creating them, or destroying them, are best handled in e_create and e_destroy because causing recursion inside a constructor or destructor could cause XVT++ to operate on objects that are not yet completely initialized.

```
MyTopLevelWin::MyTopLevelWin()
{
    Data.foo = 0;
    Data.secondaryView = (XVT_TopLevelWin*)0;
    // initialize remainder of data...
}

MyTopLevelWin::~MyTopLevelWin()
{
    delete Data...
    // deallocate memory, etc...
}
```

In the window's e_create method, you must create the controls contained by the window. You create a control by applying the operator new to the control subclass and then calling one of the control's Init methods. If the window was specified in resources, the underlying controls already exist and you can use the Init method with no arguments. If the control is being created at runtime, then you must use the Init method with parameters.

In the resource case, the native controls already exist. The Init method simply hooks the XVT++ control object up to the existing native control. If you attempt to use a native control that has not been hooked up to an XVT++ control, you will cause an error. In the runtime case, the native control is actually created by the Init call.

Menu items are similar to controls in that you must replace default menu item instances with your own menu item subclasses in order to create an operable menu. Alternatively, you could create an XVT_Menu structure from scratch and then associate it with the window by calling SetMenu:

```
class MyListbox;
class MyFileQuitMenuItem;
class MyFileOpenMenuItem;
    .
    .
    .

void
MyTopLevelWin::e_create()
{
//  Create controls...
```

```
    {
        register XVT_Control* newControl;

        newControl = new MyListbox( this, LISTBOX_CID );
        newControl->Init();

        // and so on for the remainder of the controls
            .
            .
            .

    }

//  Create menu items...

    {
        register XVT_MenuItem* newMenuItem;

        Menu->Replace( new MyFileQuitMenuItem(...) );
        Menu->Replace( new MyFileOpenMenuItem(...) );

        // and so on for the remainder of the menu items
            .
            .
            .

    }

//  Create the associated window

    Data.secondaryView = new SecondaryViewWin(...);
    Data.secondaryView->Init( SECONDARY_VIEW_RID );
}

void
MyTopLevelWin::e_destroy()
{
//  Dispose of the associated window

    Data.secondaryView->Close();
}

void
MyTopLevelWin::e_char( short chr, BOOLEAN shift, BOOLEAN
control )
{
//  Do whatever this window does when characters
//  are received.
}
```

Note that the associated window, `Data.secondaryView`, is created and destroyed in the `e_create`/`e_destroy` methods and not in the

constructor/destructor methods, so as to avoid causing recursion in constructors.

The process of creating a top-level window subclass is very similar to creating detached window or dialog subclasses. With obvious modifications, you can apply this example to those classes as well.

Constructors

`XVT_TopLevelWin()`
Create a top level window. The actual method by which the native window will be created is determined by which `Init` function is called.

`virtual ~XVT_TopLevelWin()`
Removes the top level window from the task window's list of child windows.

Member Functions

XVT_TopLevelWin::Init

INITIALIZE THE WINDOW

Prototypes

```
BOOLEAN
Init(
        WIN_TYPE                wtype,
        XVT_Rct                 boundary,
        const char*             title,
        long                    menu_rid,
        long                    flags )

BOOLEAN
Init(
        long                    rid )
```

Parameters

`wtype`
The type of window to be created. It should be one of `W_DOC`, `W_DBL`, or `W_PLAIN`.

`boundary`
The bounding rectangle (in pixels) of the window's client area. On native window-systems with a task window, the rectangle is

relative to the task window's client area. On all other native window systems, it is in screen coordinates.

`title`
The window's title. If the `wtype` is `W_DOC`, the title is set as though `SetDocTitle` had been called; otherwise, it will be set as though `SetTitle` was called.

`menu_rid`
The resource ID for the window's menu.

`flags`
A bitwise OR'd combination of flags that control the window's attributes and decoration.

`rid`
The resource ID by means of which the window's dimensions, attributes, and contents can be located.

Return Value

`TRUE` if the window was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by windows. Recovery can be attempted by disposing of the new window, closing another window, and retrying the creation of the window.

Description

The `Init` member functions create the native window and call the window's `e_create` method. When execution returns from the `Init` call, the window is complete and ready to use. Prior to the `Init` call, the window is not usable.

`Init( wtype, boundary, title, menu_rid, flags )`
Creates only a window with the given parameters. XVT++ control objects must be created separately by the user.

`Init( rid )`
Creates a window and contained controls from a resource specification. XVT++ control objects corresponding to the controls described in the resource must be created and installed separately by the application developer. The recommended place to do this is in the window's `e_create` member function; however, the control objects may be created at any time. Events intended for controls that have no corresponding XVT++ control object will cause a run-time error.

Equivalent C Functions

create_window()

create_def_window()

create_res_window()

Implementation Members

```
BOOLEAN Init( XVT_WindowDef* def )
```

Inherited Member Functions

From XVT_MenuWin

page 286 virtual void e_close()

page 287 virtual void e_font(XVT_Font font, FONT_PART part)

page 287 XVT_Menu *GetMenu()

page 288 void GetTitle(char *buffer, long len)

page 289 void SetDocTitle(char *str)

page 289 void SetFontMenu(XVT_Font font)

page 290 void SetMenu(XVT_Menu *menu)

page 291 void SetTitle(char *str)

From XVT_ChildBase

page 49 virtual void e_hscroll(SCROLL_CONTROL activity, short pos)

page 49 virtual void e_vscroll(SCROLL_CONTROL activity, short pos)

page 50 XVT_TextEdit* GetActiveTextEdit()

page 50 XVT_Pnt GetCaretPos() const

page 51 BOOLEAN GetCaretState() const

page 51 BOOLEAN GetEnabledState()

page 51 XVT_ChildBase *GetParent() const

page 52 long GetScrollPosition(SCROLL_TYPE scroll_type) const

page 52 long GetScrollProportion(SCROLL_TYPE scroll_type) const

page 53 void GetScrollRange(SCROLL_TYPE scroll_type, long *min, long *max) const

page 54 XVT_TextEdit* GetTextEdit(long id)

page 54 BOOLEAN GetVisibleState()

page 55 void MakeFront()

page 55 void ReleaseMouse()

page 56 void SetCaretDimensions(XVT_Pnt vector)

page 56 void SetCaretPos(XVT_Pnt point)

page 57 void SetCaretState(BOOLEAN state)

page 57 void SetCursor(CURSOR cursor)

page 58 void SetEnabledState(BOOLEAN state)

page 59 void SetScrollPosition(SCROLL_TYPE scroll_type, long position)

page 60 void SetScrollProportion(SCROLL_TYPE scroll_type, long proportion)

page 60 void SetScrollRange(SCROLL_TYPE scroll_type, long min, long max, long pos)

page 61 void SetVisibleState(BOOLEAN f)

page 62 void TrapMouse()

From XVT_DrawableContainer

page 129 void Clear()

page 129 void Clear(XVT_Color color)

page 129 void Close()

page 128 XVT_BaseDrawProto* DrawProtocol

page 130 virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)

page 131 virtual void e_create()

page 132 virtual void e_destroy()

page 132 virtual void e_focus(BOOLEAN active)

page 133
```
virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 134
```
virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 136 `virtual void e_size( XVT_Rct boundary )`

page 137 `virtual void e_timer( long id )`

page 137 `virtual void e_update( XVT_Rct boundary )`

page 139 `virtual long e_user( long id, void *data )`

page 140 `XVT_Control *GetCtl( long cid )`

page 140 `long GetCtlCount()`

page 141 `EVENT_MASK GetEventMask() const`

page 141 `XVT_Control *GetFirstCtl()`

page 142 `XVT_ChildBase *GetFirstWin()`

page 142 `XVT_Control *GetNextCtl()`

page 143 `XVT_ChildBase *GetNextWin()`

page 143 `long GetWinCount()`

page 144 `void Invalidate()`

page 144 `void Invalidate( XVT_Rctregion )`

page 145
```
void Scroll(
XVT_Rct boundary,
long dh,
long dv )
```

page 146 void SetEventMask(EVENT_MASK ask)

page 148 void SetInnerRect(XVT_Rct r)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

3

XVT++ 1.1 COMPATIBILITY CLASSES

This chapter describes the XVT++ 1.1 compatibility classes and member functions.

XVT++ 1.1 to 2.0 Member Function Map

This section is for programmers familiar with version 1.1 of the XVT++ Portability Toolkit; it presents the XVT++ 1.1 member functions and their corresponding XVT++ 2.0 member functions.

Note: Although the XVT++ 1.1 member functions are supported by XVT++ 2.0, we encourage you to upgrade your application to the latest XVT++ functionality.

The member functions are presented in the table below. The *Ret* column indicates whether the parameters (P), return value type (R), or both (PR) are identical for both functions. When both parameter and return value are identical, you should be able to simply substitute the 2.0 function name for its 1.1 counterpart. An X indicates that neither parameter nor return type is identical.

The page number for the description of the XVT++ 2.0 member function in this *Reference* is provided in the *Pg* column.

In some cases, multiple XVT++ 2.0 member functions are listed for one XVT++ 1.1 member function; for example, the function `BaseXVT::disable`. In these cases, the appropriate 2.0 member function to use depends on the type of object on which the function is operating. Refer to the member function descriptions for more information.

The following XVT++ 1.1 member functions do not have corresponding XVT++ 2.0 member functions and are not listed in the table:

BaseWin::dispatch	DlgWin::set_def	ScreenWin::set_def
BaseWin::set_timer	Font::set_font	StrList::get
BaseXVT::get_type	Rct::set	StrList::valid

XVT++ 1.0 Member Function	XVT++ 2.0 Member Function	Ret	Pg
BaseWin::get_client	XVT_Base::GetInnerRect	P	12
BaseWin::get_mask	XVT_Dialog::GetEventMask	PR	116
	XVT_DrawableContainer::GetEventMask		141
BaseWin::set_font	XVT_BaseDrawProto::SetFont	R	34
BaseWin::set_mask	XVT_Dialog::SetEventMask	PR	120
	XVT_DrawableContainer::SetEventMask		146
BaseXVT::disable	XVT_ChildBase::SetEnabledState	R	58
	XVT_Control::SetEnabledState		97
	XVT_Dialog::SetEnabledState		120
BaseXVT::enable	XVT_ChildBase::SetEnabledState	R	58
	XVT_Control::SetEnabledState		97
	XVT_Dialog::SetEnabledState		120
BaseXVT::get_rect	XVT_Base::GetOuterRect	P	13
BaseXVT::get_text	XVT_Dialog::GetTitle	X	118
	XVT_Label::GetTitle		239
	XVT_MenuWin::GetTitle		288

XVT++ 1.0 Member Function	XVT++ 2.0 Member Function	Ret	Pg
BaseXVT::hide	XVT_ChildBase::SetVisibleState	R	61
	XVT_Control::SetVisibleState		98
	XVT_Dialog::SetVisibleState		123
BaseXVT::move	XVT_Control::SetInnerRect	R	98
	XVT_Dialog::SetInnerRect		121
	XVT_DrawableContainer::SetInnerRect		148
BaseXVT::parent	XVT_ChildBase::GetParent	PR	51
	XVT_Control::GetParent		95
BaseXVT::set_text	XVT_Dialog::SetTitle	PR	122
	XVT_Label::SetTitle		240
	XVT_MenuWin::SetTitle		291
BaseXVT::show	XVT_ChildBase::SetVisibleState	PR	61
	XVT_Control::SetVisibleState		98
	XVT_Dialog::SetVisibleState		123
Control::check	XVT_CheckBox::SetCheckedState	R	45
	XVT_Toggle::SetCheckedState		320
Control::close	XVT_Control::Close	PR	92
	XVT_Dialog::Close		109
	XVT_DrawableContainer::Close		129
	XVT_TaskWin::Close		362
Control::create_def	XVT_Control::Init	R	96
	XVT_Icon::Init		240

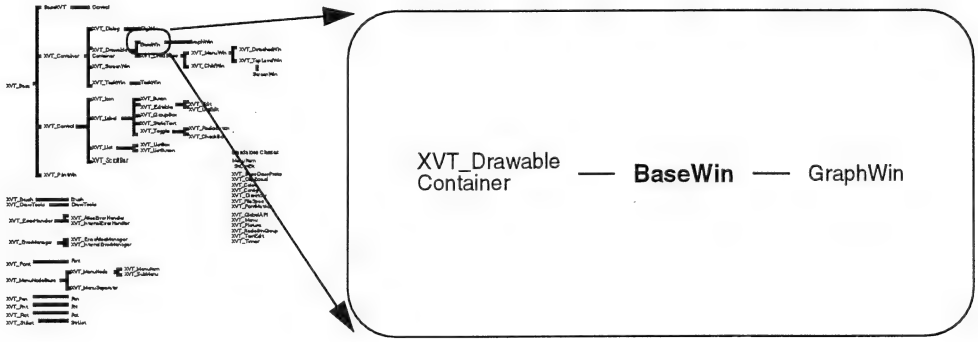
XVT++ 1.0 Member Function	XVT++ 2.0 Member Function	Ret	Pg
	XVT_Label::Init		239
	XVT_ScrollBar::Init		341
Control::create_scratch	XVT_Control::Init	R	96
	XVT_Icon::Init		230
	XVT_Label::Init		239
	XVT_ScrollBar::Init		341
Control::get_scroll_pos	XVT_ChildBase::GetScrollPosition	X	52
	XVT_ScrollBar::GetScrollPosition		339
Control::get_scroll_proportion	XVT_ChildBase::GetScrollProportion	X	52
	XVT_ScrollBar::GetScrollProportion		340
Control::get_scroll_range	XVT_ChildBase::GetScrollRange	X	53
	XVT_ScrollBar::GetScrollRange		340
Control::lbox_add	XVT_List::Add	X	244
Control::lbox_clear	XVT_List::Clear	P	245
Control::lbox_count_all	XVT_List::CountAll	P	245
Control::lbox_count_sel	XVT_List::CountSelections	P	246
Control::lbox_delete	XVT_List::Delete	X	246
Control::lbox_get_all	XVT_List::GetAll	P	247
Control::lbox_get_elt	XVT_List::GetElement	R	247
Control::lbox_get_first_sel	XVT_List::GetFirstSelection	R	248
Control::lbox_get_sel	XVT_List::GetSelections	P	249
Control::lbox_get_sel_index	XVT_List::GetSelectionIndex	P	249

XVT++ 1.0 Member Function	XVT++ 2.0 Member Function	Ret	Pg
Control::lbox_is_sel	XVT_List::GetSelectedState	R	248
Control::lbox_resume	XVT_ListBox::SetSuspendedState	R	255
Control::lbox_set_sel	XVT_List::SetSelectedState	X	250
Control::lbox_suspend	XVT_ListBox::SetSuspendedState	R	255
Control::select_text	XVT_Editable::SelectText	R	163
Control::set_scroll_pos	XVT_ChildBase::SetScrollPosition	R	59
	XVT_ScrollBar::SetScrollPosition		342
Control::set_scroll_proportion	XVT_ChildBase::SetScrollProportion	R	60
	XVT_ScrollBar::SetScrollProportion		342
Control::set_scroll_range	XVT_ChildBase::SetScrollRange	R	60
	XVT_ScrollBar::SetScrollRange		343
Control::uncheck	XVT_CheckBox::SetCheckedState	R	45
	XVT_Toggle::SetCheckedState		320
DlgWin::create	XVT_Dialog::Init	R	119
DlgWin::create_def	XVT_Dialog::Init	R	119
Font::check	XVT_MenuWin::SetFontMenu	R	289
GraphWin::arc	XVT_BaseDrawProto::DrawArc	R	17
GraphWin::get_tools	XVT_BaseDrawProto::GetBrush	P	26
	XVT_BaseDrawProto::GetPen		28
	XVT_BaseDrawProto::GetDrawTools		28
	XVT_BaseDrawProto::GetDrawMode		27
GraphWin::icon	XVT_BaseDrawProto::DrawIcon	R	18

XVT++ 1.0 Member Function	XVT++ 2.0 Member Function	Ret	Pg
GraphWin::line	XVT_BaseDrawProto::DrawALine	R	16
GraphWin::move_to	XVT_BaseDrawProto::SetCurrentPoint	R	32
GraphWin::oval	XVT_BaseDrawProto::DrawOval	R	19
GraphWin::pie	XVT_BaseDrawProto::DrawPie	R	21
GraphWin::polygon	XVT_BaseDrawProto::DrawPolygon	R	22
GraphWin::polyline	XVT_BaseDrawProto::DrawPolyline	R	23
GraphWin::rectangle	XVT_BaseDrawProto::DrawRect	R	23
GraphWin::rounded_rectangle	XVT_BaseDrawProto::DrawRoundedRect	R	24
GraphWin::set_brush	XVT_BaseDrawProto::SetBrush	R	31
GraphWin::set_font	XVT_BaseDrawProto::SetFont	R	34
GraphWin::set_mode	XVT_BaseDrawProto::SetDrawMode	PR	33
GraphWin::set_pen	XVT_BaseDrawProto::SetPen	R	36
GraphWin::set_tools	XVT_BaseDrawProto::SetDrawTools	R	34
GraphWin::text	XVT_BaseDrawProto::DrawText	R	25
MenuItem::check	XVT_MenuItem::SetCheckedState	PR	275
MenuItem::disable	XVT_MenuNode::SetEnabledState	R	279
MenuItem::enable	XVT_MenuNode::SetEnabledState	PR	279
MenuItem::uncheck	XVT_MenuItem::SetCheckedState	R	275
Rct::empty	XVT_Rct::IsEmpty	PR	329
ScreenWin::create	XVT_ChildWin::Init	R	67
	XVT_DetachedWin::Init		102
	XVT_TopLevelWin::Init		401

XVT++ 1.0 Member Function	XVT++ 2.0 Member Function	Ret	Pg
ScreenWin::create_def	XVT_ChildWin::Init	R	67
	XVT_DetachedWin::Init		102
	XVT_TopLevelWin::Init		401
ScreenWin::create_scratch	XVT_ChildWin::Init	R	67
	XVT_DetachedWin::Init		102
	XVT_TopLevelWin::Init		401
ScreenWin::get_metrics	XVT_BaseDrawProto::GetFontMetrics	X	28
StrList::add	XVT_StrList::Add	X	350
StrList::count	XVT_StrList::Count	P	352
StrList::dbg	XVT_StrList::Debug	PR	352
StrList::elt	XVT_StrList::GetElement	X	353
StrList::first	XVT_StrList::GetFirst	X	353
StrList::next	XVT_StrList::GetNext	X	354
StrList::rem	XVT_StrList::Remove	X	355
TaskWin::begin	XVT_TaskWin::Init	R	366

BaseWin



Overview

Header File	kbasewin.hpp
Source File	kbasewin.cc
Superclass	XVT_DrawableContainer
Subclasses	GraphWin
Usage	Abstract

In XVT++ 1.1, the class BaseWin was the base class for all windows and dialogs. It defined all the interface common to those objects.

Member Functions

The following functions are identical to those implemented by BaseXVT:

page 425 virtual void disable()

page 425 virtual void enable(BOOLEAN enabled = TRUE)

page 426 WIN_DEF* get_def() const

page 426 Rct get_rect() const

page 427 `virtual SSTR* get_text( char* buffer, int len ) const`

page 427 `WIN_TYPE get_type() const`

page 428 `virtual void hide()`

page 428 `virtual void move( Rct boundary )`

page 428 `WINDOW parent()`

page 429 `void put_def( WIN_DEF* In_def )`

page 429 `virtual void set_text( char* str )`

page 430 `virtual void show( BOOLEAN visible = TRUE )`

The following functions are identical to those implemented by `XVT_MenuWin`:

page 286 `virtual void e_close()`

page 287 `virtual void e_font( XVT_Font font, FONT_PART part )`

The following functions are identical to those implemented by `XVT_ChildBase`:

page 49 `virtual void e_hscroll( SCROLL_CONTROL activity, short pos )`

page 49 `virtual void e_vscroll( SCROLL_CONTROL activity, short pos )`

The following function is identical to that implemented by `XVT_TaskWin`:

page 364 `virtual BOOLEAN e_quit( BOOLEAN query_only )`

BaseWin::dispatch

DISPATCH AN EVENT TO THIS WINDOW

Prototypes

```
long
dispatch(
        EVENT*                  event )
```

Parameters

`event`
The event to be dispatched.

Return Value

Always 0.

Description

Dispatches an event to this window. The appropriate virtual event handler will be called.

Equivalent C Function

`dispatch_event()`

BaseWin::e_activate

RECEIVE NOTIFICATION OF ACTIVATION

Prototypes

```
virtual void
e_activate()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to activation.

Calls to this function notify the object that it has gained keyboard focus and may begin receiving calls to its `e_char` method.

BaseWin::e_command

RECEIVE NOTIFICATION OF A MENU SELECTION

Prototypes

```
virtual void
e_command(
        MenuItem            menu_item,
        BOOLEAN             shift,
        BOOLEAN             control )
```

Parameters

`menu_item`
An object corresponding to the selected menu item.

`shift`
A flag that is `TRUE` if the shift key was held down during the menu selection, `FALSE` otherwise.

`control`
A flag that is `TRUE` if the control key was held down during the menu selection, `FALSE` otherwise.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to menu selections.

Calls to this function notify the object that the user has selected an item from the associated menu.

BaseWin::e_control

RECEIVE NOTIFICATION OF CONTROL OPERATION

Prototypes

```
virtual void
e_control(
        int                     cid,
        CONTROL_INFO*           info )
```

Parameters

`cid`
The ID of the control being operated.

`info`
Information about the operation.

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to control operation by the user.

Calls to this function notify the object that the user has manipulated one of its contained controls.

BaseWin::e_deactivate

RECEIVE NOTIFICATION OF DEACTIVATION

Prototypes

```
virtual void
e_deactivate()
```

Description

This member function must be overridden by a subclass if the application wishes to take any actions in response to deactivation.

Calls to this function notify the object that it has lost keyboard focus and will not receive further calls to its `e_char` method until it receives another `e_activate` call.

BaseWin::get_client

RETRIEVE THE CLIENT AREA

Prototypes

```
Rct
get_client() const
```

Return Value

The client area rectangle. The rectangle is given in the coordinates of this window, which means that the upper left corner is always (0,0).

Description

Retrieves the object's client area.

Equivalent C Function

```
get_client_rect()
```

BaseWin::get_mask

RETRIEVE THE EVENT DELIVERY MASK

Prototypes

```
EVENT_MASK
get_mask() const
```

Return Value

The current event delivery mask.

Equivalent C Function

```
get_event_mask()
```

BaseWin::get_win

RETRIEVE THE OBJECT'S WINDOW HANDLE

Prototypes

```
WINDOW
get_win() const
```

Return Value

This object's window handle.

BaseWin::set_font

SET THE CURRENT FONT

Prototypes

```
void
set_font(
        FONT                    font,
        BOOLEAN                 scale = FALSE )
```

Parameters

`font`
The new current font.

`scale`
A flag that is `TRUE` if the font is to be scaled, `FALSE` if not.

Description

Sets the current font.

Equivalent C Function

```
win_set_font()
```

BaseWin::set_mask

SET THE EVENT DELIVERY MASK

Prototypes

```
void
set_mask(
        EVENT_MASK              mask )
```

Parameters

`mask`
The new event delivery mask.

Description

Sets the event delivery mask.

Equivalent C Function

```
set_event_mask()
```

BaseWin::set_timer

SET A TIMER

Prototypes

```
long
set_timer(
        long                    interval )
```

Parameters

`interval`
The timer interval in milliseconds.

Return Value

The ID of this timer.

Description

Sets a timer.

Equivalent C Function

set_timer()

Implementation Members

set_win
set_inited
class_name

Inherited Member Functions

From XVT_DrawableContainer

page 129 void Clear()

page 129 void Clear(XVT_Color color)

page 129 void Close()

page 128 XVT_BaseDrawProto* DrawProtocol

page 130 virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)

page 131 virtual void e_create()

page 132 virtual void e_destroy()

page 132 virtual void e_focus(BOOLEAN active)

page 133 virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 134 virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 136 `virtual void e_size( XVT_Rct boundary )`

page 137 `virtual void e_timer( long id )`

page 137 `virtual void e_update( XVT_Rct boundary )`

page 139 `virtual long e_user( long id, void *data )`

page 140 `XVT_Control *GetCtl( long cid )`

page 140 `long GetCtlCount()`

page 141 `EVENT_MASK GetEventMask() const`

page 141 `XVT_Control *GetFirstCtl()`

page 142 `XVT_ChildBase *GetFirstWin()`

page 142 `XVT_Control *GetNextCtl()`

page 143 `XVT_ChildBase *GetNextWin()`

page 143 `long GetWinCount()`

page 144 `void Invalidate()`

page 144 `void Invalidate( XVT_Rctregion )`

page 145
```
void Scroll(
XVT_Rct boundary,
long dh,
long dv )
```

page 146 `void SetEventMask( EVENT_MASK ask )`

page 148 `void SetInnerRect( XVT_Rct r )`

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`

page 10 `virtual DlgWin* CastToDlgWin()`

page 10 `virtual ScreenWin* CastToScreenWin11()`

page 10 `virtual TaskWin* CastToTaskWin11()`

page 11 `virtual XVT_Button *CastToButton()`

page 11 `virtual XVT_CheckBox *CastToCheckBox()`

page 11 `virtual XVT_ChildWin *CastToChildWin()`

page 11 `virtual XVT_DetachedWin *CastToDetachedWin()`

page 11 `virtual XVT_Dialog *CastToDialog()`

page 11 `virtualXVT_DrawableContainer*CastToDrawableContainer()`

page 11 `virtual XVT_Edit *CastToEdit()`

page 11 `virtual XVT_GroupBox *CastToGroupBox()`

page 11 `virtual XVT_Icon *CastToIcon()`

page 11 `virtual XVT_ListBox *CastToListBox()`

page 11 `virtual XVT_ListButton *CastToListButton()`

page 11 `virtual XVT_ListEdit *CastToListEdit()`

page 11 `virtual XVT_MenuWin *CastToMenuWin()`

page 11 `virtual XVT_PrintWin *CastToPrintWin()`

page 11 `virtual XVT_RadioButton *CastToRadioButton()`

page 11 `virtual XVT_ScreenWin *CastToScreenWin()`

page 11 `virtual XVT_ScrollBar *CastToScrollBar()`

page 11 `virtual XVT_StaticText *CastToStaticText()`

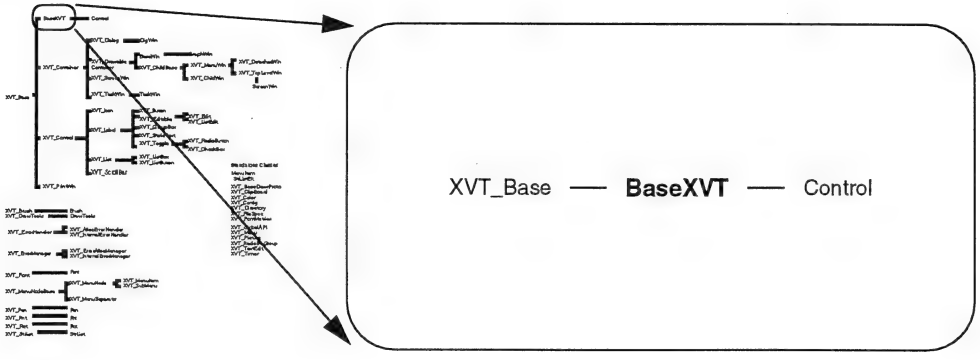
page 11 `virtual XVT_TaskWin *CastToTaskWin()`

page 11 `virtual XVT_TopLevelWin *CastToTopLevelWin()`

page 12 `virtual XVT_Rct GetInnerRect()`

page 13 `virtual XVT_Rct GetOuterRect()`

BaseXVT



Overview

Header File	`kbase.hpp`
Source File	`kbase.cc`
Superclass	`XVT_Base`
Subclasses	`Control`
Usage	Implementation

This is the abstract class from which the XVT++ 1.1 hierarchy was derived. It provides default implementations of features common to all the various interface objects.

This class is completely compatible with the XVT++ 1.1 class of the same name.

Member Functions

BaseXVT::close

CLOSE AN OBJECT

Prototypes

```
virtual void
close()
```

Description

Closes an object.

BaseXVT::disable

DISABLE AN OBJECT

Prototypes

```
virtual void
disable()
```

Description

Disables an object.

Equivalent C Function

```
enable_window()
```

BaseXVT::enable

ENABLE OR DISABLE AN OBJECT

Prototypes

```
virtual void
enable(
        BOOLEAN                 enabled = TRUE )
```

Parameters

`enabled`
A flag that is `TRUE` if the object is to be enabled, `FALSE` if it is to be disabled.

Description

Enables or disables an object.

Equivalent C Function

`enable_window()`

BaseXVT::get_def

RETRIEVE THE STORED WINDOW DEFINITION

Prototypes

```
WIN_DEF*
get_def() const
```

Return Value

A pointer to the stored window definition.

BaseXVT::get_rect

RETRIEVE THE OUTER RECTANGLE

Prototypes

```
Rct
get_rect() const
```

Return Value

The object's extent rectangle relative to its parent if successful, an empty rectangle if not.

Equivalent C Function

`get_outer_rect()`

BaseXVT::get_text

RETRIEVE AN OBJECT'S TITLE

Prototypes

```
virtual SSTR*
get_text(
        char*                   buffer,
        int                     len ) const
```

Parameters

`buffer`
A buffer to hold the object's title.

`len`
The length of `buffer` in bytes.

Return Value

`buffer`.

Equivalent C Function

`get_title()`

BaseXVT::get_type

RETRIEVE AN OBJECT'S WINDOW TYPE

Prototypes

```
WIN_TYPE
get_type() const
```

Return Value

The object's window type.

Equivalent C Function

`get_window_type()`

BaseXVT::hide

HIDE AN OBJECT

Prototypes

```
virtual void
hide()
```

Description

Hides an object.

Equivalent C Function

```
show_window()
```

BaseXVT::move

MOVE AN OBJECT

Prototypes

```
virtual void
move(
        Rct                     boundary )
```

Parameters

`boundary`
The new size and position of the object's client area.

Description

Moves or resizes an object.

Equivalent C Function

```
move_window()
```

BaseXVT::parent

RETRIEVE THE OBJECT'S PARENT WINDOW

Prototypes

```
WINDOW
parent()
```

Return Value

The window handle of the object's parent.

Equivalent C Function

`get_parent()`

BaseXVT::put_def

SET THE STORED WINDOW DEFINITION

Prototypes

```
void
put_def(
        WIN_DEF*                In_def )
```

Parameters

`In_def`
The new window definition.

Description

Sets the stored window definition.

BaseXVT::set_text

SET AN OBJECT'S TITLE

Prototypes

```
virtual void
set_text(
        char*                   str )
```

Parameters

`str`
The new title.

Description

Sets an object's title.

Equivalent C Function

`set_title()`

BaseXVT::show

SHOW OR HIDE AN OBJECT

Prototypes

```
virtual void
show(
        BOOLEAN                 visible = TRUE )
```

Parameters

`visible`
A flag that is `TRUE` if the object is to be visible, `FALSE` if it is to be invisible.

Description

Shows or hides an object.

Equivalent C Function

`show_window()`

Implementation Members

`CloseProtocol`
`ShowProtocol`
`EnableProtocol`
`TitleProtocol`
`MoveProtocol`
`class_name`

Inherited Member Functions

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`
page 10 `virtual DlgWin* CastToDlgWin()`
page 10 `virtual ScreenWin* CastToScreenWin11()`
page 10 `virtual TaskWin* CastToTaskWin11()`
page 11 `virtual XVT_Button *CastToButton()`
page 11 `virtual XVT_CheckBox *CastToCheckBox()`

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

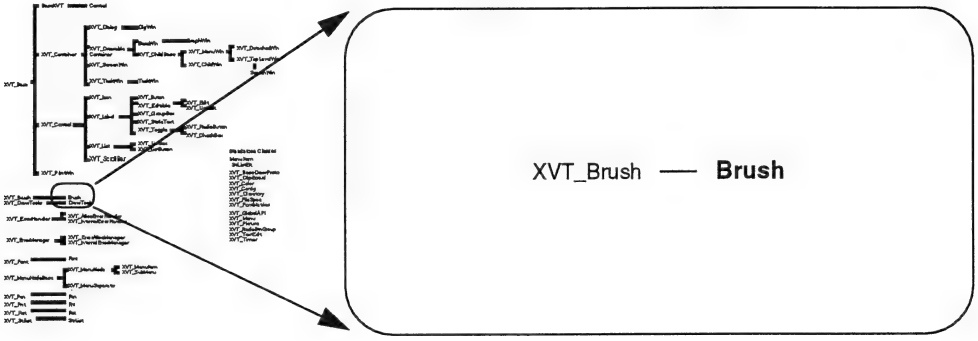
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

Brush



Overview

Header File	ktool.hpp
Source File	ktool.cc
Superclass	XVT_Brush
Subclasses	
Usage	Concrete

Constructors

```
Brush( COLOR clr = COLOR_WHITE,
    PAT_STYLE pat = PAT_SOLID )
```

Member Functions

Brush::brush

CONVERT A BRUSH TO/FROM A C CBRUSH STRUCTURE

Prototypes

```
CBRUSH
brush()

Brush
brush(
        CBRUSH                  brsh )
```

Parameters

`brsh`
The C `CBRUSH` structure to convert from.

Return Value

`brush()`
The equivalent C CBRUSH structure.

`brush( brsh )`
This brush.

Description

`brush()`
Converts a `brush` to a C CBRUSH structure.

`brush( brsh )`
Converts a C CBRUSH structure to a `brush`.

Implementation Notes

The `brush( brsh )` form of the call is a little odd in that it modifies the `brush` *and* returns a copy of the modified `brush`.

Brush::color

RETRIEVE OR SET THE BRUSH'S COLOR

Prototypes

```
COLOR
color()

void
color(
        COLOR                   clr )
```

Parameters

`clr`
The brush's new color.

Return Value

The brush's current color.

Description

`color()`
Retrieves the current color.

`color( clr )`
Sets the brush's current color.

Brush::pat

RETRIEVE OR SET THE BRUSHES' PATTERN

Prototypes

```
PAT_STYLE
pat()

void
pat(
        PAT_STYLE               p )
```

Parameters

`p`
The brush's new pattern.

Return Value

The brush's current pattern.

Description

`pat()`
Retrieves the brush's current pattern.

`pat( p )`
Sets the brush's current pattern.

Implementation Members

```
char* class_name()
```

Inherited Member Functions

From XVT_Brush

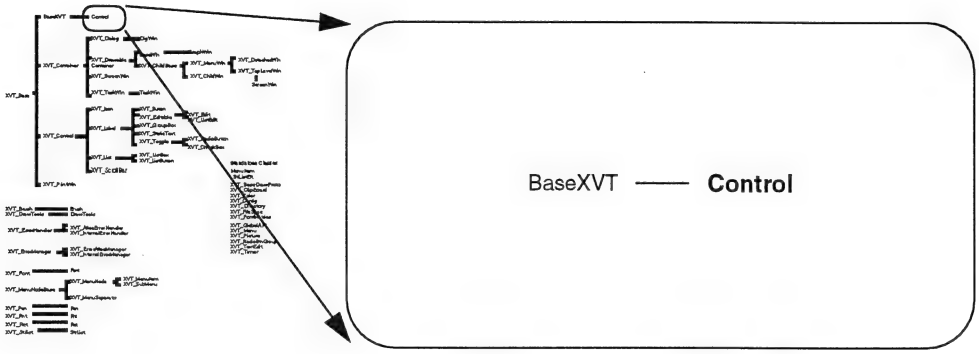
page 38 `XVT_Color GetColor()`

page 38 `PAT_STYLE GetPattern()`

page 39 `void SetColor( XVT_Color c )`

page 39 `void SetPattern( PAT_STYLE p )`

Control



Overview

Header File	`kctl.hpp`
Source File	`kctl.cc`
Superclass	`BaseXVT`
Subclasses	
Usage	Concrete

Instances of the `Control` class represent controls.

This class is fully compatible with the XVT++ 1.1 `Control` class.

Constructors

```
Control( XVT_Base* parent = NULL, int cid = 0,
    CONTROL_INFO* ci = NULL )
virtual ~Control()
```

Member Functions

Control::check

CHECK A CHECK BOX OR RADIO BUTTON

Prototypes

```
void
check(
        BOOLEAN                 check_me = TRUE )

void
check(
        int                     i1,
        int                     i2 )

void
check(
        Control*                ctlarray[],
        int                     numctls )
```

Parameters

`check_me`
A flag that is `TRUE` if the button is to be checked, `FALSE` if not.

`i1`
The control ID of the first radio button in the group.

`i2`
The control ID of the last radio button in the group.

`ctlarray`
The array of radio buttons in the group.

`numctls`
The number of controls in `ctlarray`.

Description

`check( check_me = TRUE )`
Checks a check box.

`check( i1, i2)`
Checks this radio button. The group of which this button is a part is given bounded by the two IDs given.

`check( ctlarray[], numctls )`
Checks this radio button. The group of which this button is a part is defined by the given array of controls.

Equivalent C Function

```
win_check_box()
win_check_radio_button()
```

Control::close

DESTROY A CONTROL

Prototypes

```
void
close()
```

Description

Destroys a control in a window.

Equivalent C Function

```
close_window()
```

Control::create_def

CREATE A CONTROL FROM A WIN_DEF STRUCTURE

Prototypes

```
virtual BOOLEAN
create_def(
        XVT_Base*               parent_win,
        long                    appdata = 0L)
```

Parameters

`parent_win`
The new control's parent window.

`appdata`
The new control's application data.

Return Value

`TRUE` if the control was successfully created, `FALSE` otherwise. A `FALSE` return value means that the native system ran out of some resource that is consumed by the control. Recovery can be attempted by disposing of the new control, closing another control, and retrying the creation of the control.

Description

Creates a control from a WIN_DEF structure. The WIN_DEF structure is stored with the object, and must be a result of a prior put_def. The created control can be put only into a window, not a dialog.

Equivalent C Function

create_def_control().

Control::create_scratch

CREATE A CONTROL FROM PARAMETERS

Prototypes

```
virtual BOOLEAN
create_scratch(
        XVT_Base*           parent_win,
        WIN_TYPE            wtype,
        int                 ctrl_id,
        Rct                 rct,
        long                ctl_flags,
        SSTR*               title,
        long                appdata = 0L)
```

Parameters

parent_win
: The new control's parent window.

wtype
: The new control's window type.

ctrl_id
: The new control's ID.

rct
: The new control's boundary rectangle.

ctl_flags
: The new control's attribute flags.

title
: The new control's title.

appdata
: The new control's application data.

Return Value

TRUE if the control was successfully created, FALSE otherwise. A FALSE return value means that the native system ran out of some resource that is consumed by the control. Recovery can be attempted

by disposing of the new control, closing another control, and retrying the creation of the control.

Description

Creates a control strictly from input parameters. The control may be put only in a window, not a dialog.

Equivalent C Function

```
create_control()
```

Control::get_scroll_pos

RETRIEVE A SCROLLBAR'S THUMB POSITION.

Prototypes

```
int
get_scroll_pos() const
```

Return Value

The scrollbar's current thumb position.

Equivalent C Function

```
get_scroll_pos()
```

Control::get_scroll_proportion

RETRIEVE A SCROLLBAR THUMB'S PROPORTION

Prototypes

```
int
get_scroll_proportion() const
```

Return Value

The scrollbar thumb's proportion.

Equivalent C Function

```
get_scroll_proportion()
```

Control::get_scroll_range

RETRIEVE A SCROLLBAR'S RANGE

Prototypes

```
void
get_scroll_range(
        int*                    min,
        int*                    max ) const
```

Parameters

`min`
A pointer to storage for the minimum of the range.

`max`
A pointer to storage for the maximum of the range.

Equivalent C Function

```
get_scroll_range()
```

Control::id

RETRIEVE A CONTROL'S ID

Prototypes

```
int
id() const
```

Return Value

The control's ID.

Control::is_checked

DETERMINE IF A CHECK BOX OR RADIO BUTTON IS CHECKED

Prototypes

```
BOOLEAN
is_checked() const
```

Return Value

A flag that is TRUE if the button is checked, FALSE if not.

Control::lbox_add

ADD AN ITEM OR ITEMS TO A LIST BOX

Prototypes

```
BOOLEAN
lbox_add(
        int                     index,
        SSTR*                   s )

BOOLEAN
lbox_add(
        SSTR*                   s )

BOOLEAN
lbox_add(
        int                     index,
        SLIST                   sl )

BOOLEAN
lbox_add(
        SLIST                   sl )
```

Parameters

`index`
: The index of the element before which the new element is to be added.

`s`
: The string defining the new element.

`sl`
: The string list defining the new elements.

Return Value

A flag that is TRUE if the operation was successful, FALSE if not.

Description

`lbox_add( index, s )`
: Adds a string to a list box.

`lbox_add( s )`
: Adds a string to the end of a list box.

`lbox_add( index, sl )`
Adds a list of strings to a list box.

`lbox_add( sl )`
Adds a list of strings to the end of a list box.

Equivalent C Function

```
win_list_add()
```

Control::lbox_clear

REMOVE ALL ITEMS FROM A LIST BOX

Prototypes

```
BOOLEAN
lbox_clear()
```

Return Value

A flag that is TRUE if the operation was successful, FALSE if not.

Description

Removes all items from a list box.

Equivalent C Function

```
win_list_clear()
```

Control::lbox_count_all

RETRIEVE THE NUMBER OF ITEMS IN A LIST BOX

Prototypes

```
int
lbox_count_all() const
```

Return Value

The number of items in a list box.

Equivalent C Function

```
win_list_count_all()
```

Control::lbox_count_sel

RETRIEVE THE NUMBER OF SELECTED ITEMS

Prototypes

```
int
lbox_count_sel() const
```

Return Value

The number of selected items.

Equivalent C Function

```
win_list_count_sel()
```

Control::lbox_delete

REMOVE AN ITEM

Prototypes

```
BOOLEAN
lbox_delete(
        int                     index )
```

Parameters

`index`
The index of the item to delete.

Return Value

A flag that is `TRUE` if the operation was successful, `FALSE` if not.

Equivalent C Function

```
win_list_delete()
```

Control::lbox_get_all

RETRIEVE ALL ITEMS

Prototypes

```
SLIST
lbox_get_all() const
```

Return Value

An SLIST containing all of the items in the list box.

Equivalent C Function

win_list_get_all()

Control::lbox_get_elt

RETRIEVE A LIST BOX ELEMENT

Prototypes

```
BOOLEAN
lbox_get_elt(
        int                     index,
        SSTR*                   s,
        int                     sz_s )
```

Parameters

index
: The element index. Zero is first.

s
: A buffer to receive the item text.

sz_s
: The size of the buffer pointed to by s.

Return Value

A flag that is TRUE if the operation was successful, FALSE if not.

Equivalent C Function

win_list_get_elt()

Control::lbox_get_first_sel

RETRIEVE THE FIRST SELECTED ITEM

Prototypes

```
BOOLEAN
lbox_get_first_sel(
        SSTR*                   s,
        int                     sz_s )
```

Parameters

s
A buffer to receive the item text.

sz_s
The size of the buffer pointed to by s.

Return Value

A flag that is TRUE if the operation was successful, FALSE if not.

Equivalent C Function

```
win_list_get_first_sel()
```

Control::lbox_get_sel

RETRIEVE ALL SELECTED ITEMS

Prototypes

```
SLIST
lbox_get_sel() const
```

Return Value

An SLIST containing all selected items.

Equivalent C Function

```
win_list_get_sel()
```

Control::lbox_get_sel_index

RETRIEVE THE INDEX OF THE FIRST SELECTED ITEM

Prototypes

```
int
lbox_get_sel_index() const
```

Return Value

The index of the first selected item.

Equivalent C Function

```
win_list_get_sel_index()
```

Control::lbox_is_sel

DETERMINE IF AN ITEM IS SELECTED

Prototypes

```
BOOLEAN
lbox_is_sel(
        int                     index ) const
```

Parameters

`index`
The index of the item to check for selectedness.

Return Value

A flag that is `TRUE` if the given item was selected, `FALSE` if not.

Equivalent C Function

`win_list_is_sel()`

Control::lbox_resume

RESUME UPDATES TO A LIST BOX

Prototypes

```
void
lbox_resume()
```

Description

Resumes updates to a list box. Cancels a previous call to `lbox_suspend`.

Equivalent C Function

`win_list_resume()`

Control::lbox_set_sel

SELECT AN ITEM

Prototypes

```
BOOLEAN
lbox_set_sel(
        int                     index,
        BOOLEAN                 select )

BOOLEAN
lbox_set_sel(
        BOOLEAN                 select )
```

Parameters

`index`
The index of the item to select.

`select`
A flag that is `TRUE` if the item is to be selected, `FALSE` if unselected.

Return Value

A flag that is `TRUE` if the operation was successful, `FALSE` if not.

Description

`lbox ( index, select )`
Selects/unselects the given item.

`lbox ( select )`
Selects/unselects all items.

Equivalent C Function

`win_list_set_sel()`

Control::lbox_suspend

SUSPEND UPDATES TO A LIST BOX

Prototypes

```
void
lbox_suspend()
```

Description

Suspends updates to a list box.

Equivalent C Function

```
win_list_suspend()
```

Control::select_text

SELECT TEXT

Prototypes

```
void
select_text(
        int                     from,
        int                     to )
```

Parameters

`from`
The first character index of the desired selection.

`to`
The last character index of the desired selection.

Description

Selects text in an edit control.

Equivalent C Function

```
win_select_item_text()
```

Control::set_scroll_pos

SET A SCROLLBAR'S THUMB POSITION

Prototypes

```
void
set_scroll_pos(
        int                     pos )
```

Parameters

`pos`
The new thumb position.

Description

Sets a scrollbar's thumb position.

Equivalent C Function

```
set_scroll_pos()
```

Control::set_scroll_proportion

SET A SCROLLBAR'S THUMB PROPORTION

Prototypes

```
void
set_scroll_proportion(
        int                     proportion )
```

Parameters

`proportion`
The new thumb proportion.

Description

Sets a scrollbar's thumb proportion.

Equivalent C Function

```
set_scroll_proportion()
```

Control::set_scroll_range

SET A SCROLLBAR'S RANGE

Prototypes

```
void
set_scroll_range(
        int                     min,
        int                     max )
```

Parameters

`min`
The minimum of the new range.

`max`
The maximum of the new range.

Description

Sets a scrollbar's range.

Equivalent C Function

set_scroll_range()

Control::uncheck

UNCHECK A CHECK BOX

Prototypes

```
void
uncheck()
```

Description

Unchecks a check box. Equivalent to check(FALSE).

Equivalent C Function

win_check_box()

Implementation Members

class_name
in_dialog
RealControl
GetRealControl

Inherited Member Functions

From BaseXVT

page 425 virtual void disable()
page 425 virtual void enable(BOOLEAN v = TRUE)
page 426 WIN_DEF* get_def()
page 426 Rct get_rect() const
page 427 virtual char* get_text(char *, int)
page 427 WIN_TYPE get_type() const
page 428 virtual void hide()
page 428 virtual void move(Rct r)
page 428 WINDOW parent()

page 429 `void put_def( WIN_DEF* In_def )`

page 429 `virtual void set_text( char * ch)`

page 430 `virtual void show( BOOLEAN v = TRUE )`

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`

page 10 `virtual DlgWin* CastToDlgWin()`

page 10 `virtual ScreenWin* CastToScreenWin11()`

page 10 `virtual TaskWin* CastToTaskWin11()`

page 11 `virtual XVT_Button *CastToButton()`

page 11 `virtual XVT_CheckBox *CastToCheckBox()`

page 11 `virtual XVT_ChildWin *CastToChildWin()`

page 11 `virtual XVT_DetachedWin *CastToDetachedWin()`

page 11 `virtual XVT_Dialog *CastToDialog()`

page 11 `virtualXVT_DrawableContainer*CastToDrawableContainer()`

page 11 `virtual XVT_Edit *CastToEdit()`

page 11 `virtual XVT_GroupBox *CastToGroupBox()`

page 11 `virtual XVT_Icon *CastToIcon()`

page 11 `virtual XVT_ListBox *CastToListBox()`

page 11 `virtual XVT_ListButton *CastToListButton()`

page 11 `virtual XVT_ListEdit *CastToListEdit()`

page 11 `virtual XVT_MenuWin *CastToMenuWin()`

page 11 `virtual XVT_PrintWin *CastToPrintWin()`

page 11 `virtual XVT_RadioButton *CastToRadioButton()`

page 11 `virtual XVT_ScreenWin *CastToScreenWin()`

page 11 `virtual XVT_ScrollBar *CastToScrollBar()`

page 11 `virtual XVT_StaticText *CastToStaticText()`

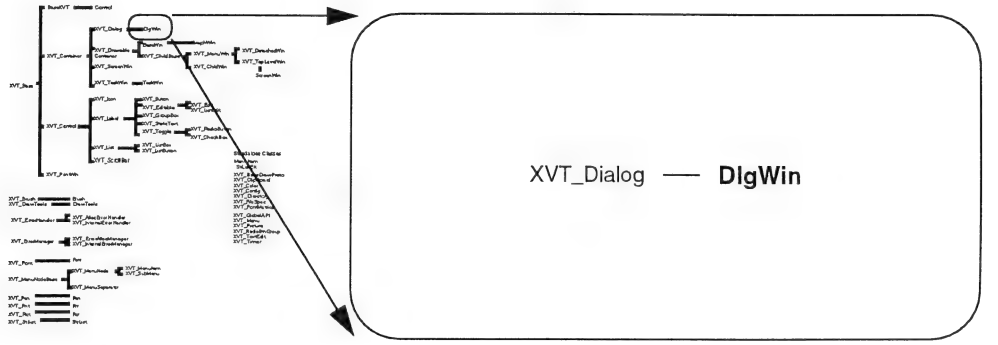
page 11 `virtual XVT_TaskWin *CastToTaskWin()`

page 11 `virtual XVT_TopLevelWin *CastToTopLevelWin()`

page 12 `virtual XVT_Rct GetInnerRect()`

page 13 `virtual XVT_Rct GetOuterRect()`

DlgWin



Overview

Header File	`kdlg.hpp`
Source File	`kdlg.cc`
Superclass	`XVT_Dialog`
Subclasses	
Usage	Abstract

The `DlgWin` class defines the interface to all dialogs.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_Dialog` instead.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Constructors

```
DlgWin()
virtual ~DlgWin()
```

Member Functions

The following functions are identical to those implemented by BaseXVT:

page 425 virtual void disable()

page 425 virtual void enable(BOOLEAN v = TRUE)

page 426 WIN_DEF* get_def() const

page 426 Rct get_rect() const

page 427 virtual SSTR* get_text(SSTR*, int) const

page 427 WIN_TYPE get_type() const

page 428 virtual void hide()

page 428 virtual void move(Rct r)

page 428 WINDOW parent()

page 429 void put_def(WIN_DEF* In_def)

page 429 virtual void set_text(SSTR* ch)

page 430 virtual void show(BOOLEAN v = TRUE)

DlgWin::create

CREATE A DIALOG FROM RESOURCES

Prototypes

```
virtual BOOLEAN
create(
        int                     rid,
        WIN_TYPE                wtype = WD_MODAL,
        long                    data = 0L )
```

Parameters

`rid`
The dialog resource ID.

`wtype`
The type of dialog, `WD_MODAL` or `WD_MODELESS`.

`userdata`
The user data associated with this dialog.

Return Value

A flag that is TRUE if the operation succeeded, FALSE if it failed.

Description

Creates a dialog from resources.

Equivalent C Function

```
create_res_dialog()
```

DlgWin::create_def

CREATE A DIALOG FROM A DEFINITION

Prototypes

```
virtual BOOLEAN
create_def(
        long                    userdata )
```

Parameters

`userdata`
The user data associated with this dialog.

Return Value

A flag that is TRUE if the operation succeeded, FALSE if it failed.

Description

Creates a dialog from a definition.

Equivalent C Function

```
create_def_dialog()
```

DlgWin::set_def

SET THE ASSOCIATED WIN_DEF FROM A RESOURCE

Prototypes

```
virtual BOOLEAN
set_def(
        int                     rid )
```

Parameters

`rid`
The resource ID from which to get the dialog definition.

Return Value

A flag that is `TRUE` if the operation succeeded, `FALSE` if it failed.

Description

Sets the associated `WIN_DEF` from a resource.

Equivalent C Function

`get_res_dialog()`

Implementation Members

`class_name`

Inherited Member Functions

From XVT_Dialog

page 109 `void Close()`

page 109
```
virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)
```

page 111 `virtual void e_close()`

page 111 `virtual void e_create()`

page 112 `virtual void e_destroy()`

page 112 `virtual void e_focus( BOOLEAN active )`

page 113 `virtual void e_size( short width, short height )`

page 114 `virtual void e_timer( long id )`

page 115 `virtual long e_user( long id, void *data )`

page 115 `XVT_Control *GetCtl( long cid )`

page 116 `long GetCtlCount()`

page 116 `BOOLEAN GetEnabledState()`

page 116 `EVENT_MASK GetEventMask() const`

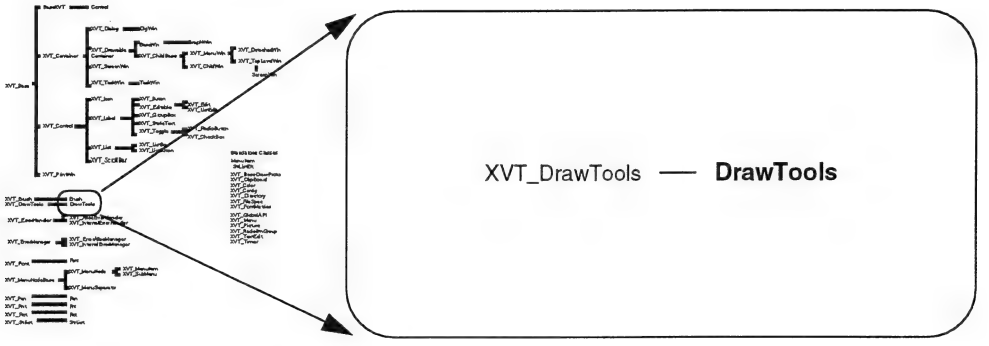
page 117 XVT_Control *GetFirstCtl()
page 117 XVT_Control *GetNextCtl()
page 118 void GetTitle(char *buffer, long len)
page 118 BOOLEAN GetVisibleState()
page 119 BOOLEAN Init(long rid)
page 119 BOOLEAN Init(XVT_DialogDef *def)
page 120 void SetEnabledState(BOOLEAN state)
page 120 void SetEventMask(EVENT_MASK ask)
page 121 void SetInnerRect(XVT_Rct rect)
page 122 void SetTitle(char *str)
page 123 void SetVisibleState(BOOLEAN)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()
page 10 virtual DlgWin* CastToDlgWin()
page 10 virtual ScreenWin* CastToScreenWin11()
page 10 virtual TaskWin* CastToTaskWin11()
page 11 virtual XVT_Button *CastToButton()
page 11 virtual XVT_CheckBox *CastToCheckBox()
page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

DrawTools



Overview

Header File	`ktool.hpp`
Source File	`ktool.cc`
Superclass	`XVT_DrawTools`
Subclasses	
Usage	Concrete

Instances of this class define how drawing primitives are rendered in a window. Each window maintains an instance of this class.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_DrawTools` instead.

Constructors

```
DrawTools()
DrawTools(Pen pn )
DrawTools(Pen pn, Brush brsh )
DrawTools(Pen pn, Brush brsh, Font fnt,
    DRAW_MODE mde = M_COPY)
```

Member Functions

DrawTools::brush

GET OR SET THE BRUSH

Prototypes

```
Brush
brush()

void
brush(
        Brush                   brsh )
```

Parameters

`brsh`
The new brush.

Return Value

`brush()`
The draw tools' brush.

Description

`brush( brsh )`
Sets the draw tools' brush.

DrawTools::font

GET OR SET THE FONT

Prototypes

```
Font
font()

void
font(
        Font                    fnt )
```

Parameters

`fnt`
The new font.

Return Value

`font()`
The draw tools' font.

Description

`font( fnt )`
Sets the draw tools' font.

DrawTools::mode

SET OR GET THE DRAW TOOLS' DRAWING MODE

Prototypes

```
DRAW_MODE
mode()

void
mode(
        DRAW_MODE               mde )
```

Parameters

`mde`
The new drawing mode.

Return Value

`mode()`
The draw tools' drawing mode.

Description

`mode(mde )`
Sets the draw tools' drawing mode.

DrawTools::pen

GET OR SET THE PEN

Prototypes

```
Pen
pen()

void
pen(
        Pen                     pen )
```

Parameters

`pen`
The new pen.

Return Value

`pen()`
The draw tools' pen.

Description

`pen( pen)`
Sets the draw tools' pen.

Implementation Members

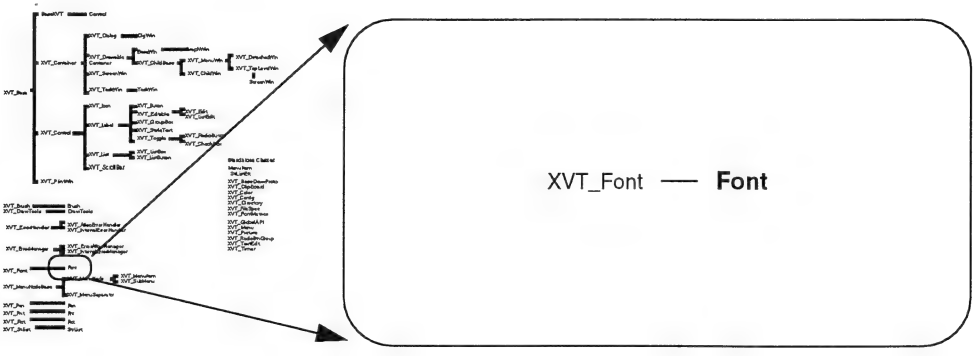
`class_name`
`ControlEvent`

Inherited Member Functions

From XVT_DrawTools

page 151 `XVT_Color GetBackColor()`
page 151 `XVT_Brush GetBrush()`
page 152 `XVT_Font GetFont()`
page 152 `XVT_Color GetForeColor()`
page 152 `DRAW_MODE GetMode()`
page 153 `BOOLEAN GetOpaqueText()`
page 153 `XVT_Pen GetPen()`
page 153 `void SetBackColor( XVT_Color c )`
page 154 `void SetBrush( XVT_Brush b )`
page 154 `void SetFont( XVT_Font f )`
page 155 `void SetForeColor( XVT_Color c )`
page 155 `void SetMode( DRAW_MODE mode )`
page 156 `void SetOpaqueText( BOOLEAN ot )`
page 157 `void SetPen( XVT_Pen p )`

Font



Overview

Header File	`ktool.hpp`
Source File	`ktool.cc`
Superclass	`XVT_Font`
Subclasses	
Usage	Concrete

Instances of this class define how text drawing primitives are rendered in a window. Each window maintains an instance of this class.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_Font` instead.

Constructors

```
Font()
Font( FONT* font_ptr )
```

Member Functions

Font::check

CHECK THE MENU ITEM CORRESPONDING TO THIS FONT

Prototypes

```
void
check(
        WINDOW                  win )
```

Parameters

`win`
The window whose font menu is checked.

Description

Checks the menu item corresponding to this font.

Equivalent C Function

`win_set_font_menu()`

Font::family

GET OR SET A FONT'S FAMILY

Prototypes

```
FONT_FAMILY*
family()

void
family(
        int                     family )
```

Parameters

`family`
The font's new family.

Return Value

`family()`
The font's family.

Description

`family( family )`
Sets the font's family.

Font::get_font

RETRIEVE THE XVT LIBRARY FONT STRUCTURE

Prototypes

```
FONT*
get_font()
```

Return Value

The C `FONT` structure corresponding to this `Font`.

Font::set_font

SELECT A FONT BASED ON FAMILY, SIZE, AND STYLE

Prototypes

```
void
set_font(
        short                   sz,
        int                     fam,
        int                     st )
```

Parameters

`sz`
The size of the desired font.

`fam`
The family of the desired font.

`st`
The style of the desired font.

Description

Selects a font based on family, size and style.

Equivalent C Function

`select_font()`

Font::size

GET OR SET A FONT'S SIZE

Prototypes

```
short
size()

void
size(
        short                   sz )
```

Parameters

`sz`
The font's new size.

Return Value

`size()`
The font's size.

Description

`size( short sz )`
Sets the font's size.

Font::style

GET OR SET A FONT'S STYLE

Prototypes

```
FONT_STYLE*
style()

void
style(
        int                     style )
```

Parameters

`style`
The font's new style.

Return Value

`style()`
The font's style.

Description

`style( style )`
Sets the font's style.

Implementation Members

`class_name`

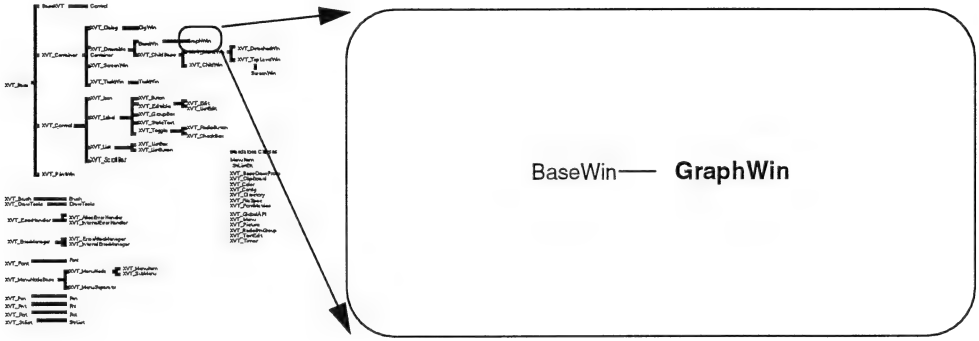
Inherited Member Functions

From XVT_Font

page 176 `short GetSize() const`

page 176 `void SetSize( short size )`

GraphWin



Overview

Header File	kgraph.hpp
Source File	kgraph.cc
Superclass	BaseWin
Subclasses	
Usage	Abstract

The GraphWin class defines the drawing interface for windows.

This class is completely compatible with the XVT++ 1.1 class of the same name.

Member Functions

The following functions are identical to those implemented by BaseXVT:

page 425 `virtual void disable()`

page 425 `virtual void enable( BOOLEAN enabled = TRUE )`

page 426 `WIN_DEF* get_def()`

page 426 Rct get_rect() const
page 427 virtual char* get_text(char* buffer, int len)
page 427 WIN_TYPE get_type() const
page 428 virtual void hide()
page 428 virtual void move(Rct boundary)
page 428 WINDOW parent()
page 429 void put_def(WIN_DEF* in_def)
page 429 virtual void set_text(char* str)
page 430 virtual void show(BOOLEAN visible = TRUE)

GraphWin::arc

DRAW AN ARC

Prototypes

```
void
arc(
        Rct             lrct,
        Pnt             start,
        Pnt             stop )
```

Parameters

`lrct`
The bounding rectangle.

`start`
The start point.

`stop`
The stop point.

Description

Draws an arc.

Equivalent C Function

`win_draw_arc()`

GraphWin::clear

CLEAR THE WINDOW

Prototypes

```
void
clear()
```

Description

Clears the window.

Implementation Notes

Note that this function is different from the `Clear` function defined elsewhere in XVT++. This version always clears the window with white.

GraphWin::get_tools

RETRIEVE THE CURRENT DRAWING TOOLS

Prototypes

```
DrawTools
get_tools() const
```

Return Value

A copy of the current draw tools.

Equivalent C Function

```
win_get_draw_ctools()
```

GraphWin::icon

DRAW AN ICON

Prototypes

```
void
icon(
        Pnt                     p,
        int                     rid )
```

Parameters

`p`
The location of the icon's upper-left corner.

`rid`
The icon's resource ID.

Description

Draws an icon.

Equivalent C Function

`win_draw_icon()`

GraphWin::line

DRAW A LINE

Prototypes

```
void
line(
        Pnt                 from,
        Pnt                 to,
        BOOLEAN             start_arrow = FALSE,
        BOOLEAN             end_arrow = FALSE)
```

Parameters

`from`
The starting point of the line.

`to`
The end point of the line.

`start_arrow`
A flag that is `TRUE` if the line is to start with an arrow, `FALSE` if not.

`end_arrow`
A flag that is `TRUE` if the line is to end with an arrow, `FALSE` if not.

Description

Draws a line with or without arrows.

Equivalent C Function

`win_draw_aline()`

GraphWin::move_to

MOVE THE CURRENT POSITION

Prototypes

```
void
move_to(
        Pnt                     p )
```

Parameters

p
The new current position.

Description

Moves the current position.

Equivalent C Function

```
win_move_to()
```

GraphWin::oval

DRAW AN OVAL

Prototypes

```
void
oval(
        Rct                     r )
```

Parameters

r
The bounding rectangle.

Description

Draws an oval.

Equivalent C Function

```
win_draw_oval()
```

GraphWin::pie

DRAW A PIE

Prototypes

```
void
pie(
        Rct                     r,
        Pnt                     start,
        Pnt                     stop )
```

Parameters

`r`
The bounding rectangle.

`start`
The start point.

`stop`
The stop point.

Description

Draws a pie.

Equivalent C Function

`win_draw_pie()`

GraphWin::polygon

DRAW A POLYGON

Prototypes

```
void
polygon(
        Pnt*                    points,
        int                     npoints )
```

Parameters

`points`
An array of points.

`npoints`
The number of points in `points`.

Description

Draws a polygon.

Equivalent C Function

`win_draw_polygon()`

GraphWin::polyline

DRAW A POLYLINE

Prototypes

```
void
polyline(
        Pnt*                    points,
        int                     npoints )
```

Parameters

`points`
An array of points.

`npoints`
The number of points in `points`.

Description

Draws a polyline.

Equivalent C Function

`win_draw_polyline()`

GraphWin::rectangle

DRAW A RECTANGLE

Prototypes

```
void
rectangle(
        Rct                     r )
```

Parameters

`r`
The rectangle.

Description

Draws a rectangle.

Equivalent C Function

```
win_draw_rect()
```

GraphWin::rounded_rectangle

DRAW A RECTANGLE WITH ROUNDED CORNERS

Prototypes

```
void
rounded_rectangle(
        Rct                     r,
        int                     oval_width = 20,
        int                     oval_height = 20 )
```

Parameters

`r`
The rectangle.

`oval_width`
The width of the corner oval.

`oval_height`
The height of the corner oval.

Description

Draws a rectangle with rounded corners.

Equivalent C Function

```
win_draw_roundrect()
```

GraphWin::set_brush

SET THE CURRENT BRUSH

Prototypes

```
void
set_brush(
        Brush                   b )
```

Parameters

b
The new brush.

Description

Sets the current brush.

Equivalent C Function

win_set_cbrush()

GraphWin::set_font

SET THE CURRENT FONT

Prototypes

```
void
set_font(
        Font                    font )
```

Parameters

font
The new font.

Description

Sets the current font.

Equivalent C Function

win_set_font()

GraphWin::set_mode

SET THE CURRENT DRAWING MODE

Prototypes

```
void
set_mode(
        DRAW_MODE               mode )
```

Parameters

mode
The new drawing mode.

Description

Sets the current drawing mode.

Equivalent C Function

```
win_set_draw_mode()
```

GraphWin::set_pen

SET THE CURRENT PEN

Prototypes

```
void
set_pen(
        Pen                     p )
```

Parameters

`p`
The new pen.

Description

Sets the current pen.

Equivalent C Function

```
win_set_cpen()
```

GraphWin::set_tools

SET THE CURRENT DRAWING TOOLS

Prototypes

```
void
set_tools(
        DrawTools               tools )
```

Parameters

`tools`
The new drawing tools.

Description

Sets the current drawing tools.

Equivalent C Function

```
win_set_draw_ctools()
```

GraphWin::text

DRAW A TEXT STRING

Prototypes

```
void
text(
        Pnt                     p,
        char*                   str,
        int                     len )
```

Parameters

`p`
The location of the start of the string's baseline.

`str`
The string.

`len`
The length of the string in bytes, or –1 if the string is null-terminated and the entire string is to be drawn.

Description

Draws a text string.

Equivalent C Function

```
win_draw_text()
```

Implementation Members

```
class_name
```

Inherited Member Functions

From BaseWin

page 415 `long dispatch( EVENT * )`

page 416 `virtual void e_activate()`

page 416 `virtual void e_command( MenuItemm i, BOOLEAN shift, BOOLEAN control )`

page 417 `virtual void e_control( int cid, CONTROL_INFO* info )`

page 418 `virtual void e_deactivate()`

page 418 `Rct get_client()`

page 419 `EVENT_MASK get_mask()`

page 419 `WINDOW get_win()`

page 419 `void set_font( Font, BOOLEAN )`

page 420 `void set_mask( EVENT_MASK mask )`

page 420 `long set_timer( long interval )`

From XVT_DrawableContainer

page 129 `void Clear()`

page 129 `void Clear( XVT_Color color )`

page 129 `void Close()`

page 128 `XVT_BaseDrawProto* DrawProtocol`

page 130
```
virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)
```

page 131 `virtual void e_create()`

page 132 `virtual void e_destroy()`

page 132 `virtual void e_focus( BOOLEAN active )`

page 133
```
virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 134
```
virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135
```
virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button )
```

page 135 virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 136 virtual void e_size(XVT_Rct boundary)

page 137 virtual void e_timer(long id)

page 137 virtual void e_update(XVT_Rct boundary)

page 139 virtual long e_user(long id, void *data)

page 140 XVT_Control *GetCtl(long cid)

page 140 long GetCtlCount()

page 141 EVENT_MASK GetEventMask() const

page 141 XVT_Control *GetFirstCtl()

page 142 XVT_ChildBase *GetFirstWin()

page 142 XVT_Control *GetNextCtl()

page 143 XVT_ChildBase *GetNextWin()

page 143 long GetWinCount()

page 144 void Invalidate()

page 144 void Invalidate(XVT_Rctregion)

page 145 void Scroll(
XVT_Rct boundary,
long dh,
long dv)

page 146 void SetEventMask(EVENT_MASK ask)

page 148 void SetInnerRect(XVT_Rct r)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

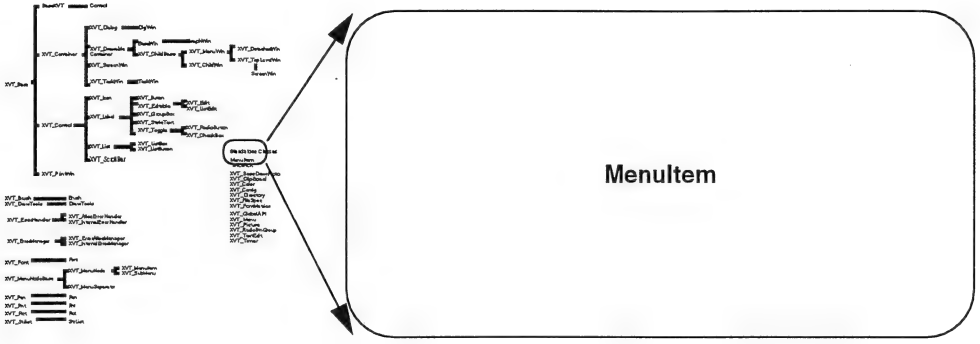
page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()
page 11 virtual XVT_DetachedWin *CastToDetachedWin()
page 11 virtual XVT_Dialog *CastToDialog()
page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()
page 11 virtual XVT_Edit *CastToEdit()
page 11 virtual XVT_GroupBox *CastToGroupBox()
page 11 virtual XVT_Icon *CastToIcon()
page 11 virtual XVT_ListBox *CastToListBox()
page 11 virtual XVT_ListButton *CastToListButton()
page 11 virtual XVT_ListEdit *CastToListEdit()
page 11 virtual XVT_MenuWin *CastToMenuWin()
page 11 virtual XVT_PrintWin *CastToPrintWin()
page 11 virtual XVT_RadioButton *CastToRadioButton()
page 11 virtual XVT_ScreenWin *CastToScreenWin()
page 11 virtual XVT_ScrollBar *CastToScrollBar()
page 11 virtual XVT_StaticText *CastToStaticText()
page 11 virtual XVT_TaskWin *CastToTaskWin()
page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()
page 12 virtual XVT_Rct GetInnerRect()
page 13 virtual XVT_Rct GetOuterRect()

MenuItem



Overview

Header File	kmtag.hpp
Source File	kmtag.cc
Superclass	
Subclasses	
Usage	Concrete

This class provides an interface to basic menu operations on a menu item. `MenuItems` are stateless, so you can create and delete them at will. You can have two instances of `MenuItem` associated with the same underlying menu item.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_MenuItem` and/or `XVT_Menu` instead.

Constructors

```
MenuItem( XVT_Base* w, MENU_TAG tag )
~MenuItem()
```

Member Functions

MenuItem::check

CHECK OR UNCHECK A MENU ITEM

Prototypes

```
void
check(
        BOOLEAN                 check_me = TRUE )
```

Parameters

check_me
A flag that is TRUE if the menu item is to be checked, FALSE if unchecked.

Description

Checks or unchecks a menu item.

Equivalent C Function

win_menu_check()

MenuItem::disable

DISABLE A MENU ITEM

Prototypes

```
void
disable()
```

Description

Disables a menu item.

Equivalent C Function

win_menu_enable()

MenuItem::enable

ENABLE OR DISABLE A MENU ITEM

Prototypes

```
void
enable(
        BOOLEAN                 enable_me = TRUE )
```

Parameters

`enable_me`
A flag that is `TRUE` if the menu item is to be enabled, `FALSE` if disabled.

Description

Enables or disables a menu item.

Equivalent C Function

`win_menu_enable()`

MenuItem::tag

RETRIEVE THE TAG OF THE ASSOCIATED MENU ITEM

Prototypes

```
MENU_TAG
tag()
```

Return Value

The tag of the associated menu item.

MenuItem::uncheck

UNCHECK A MENU ITEM

Prototypes

```
void
uncheck()
```

Description

Unchecks a menu item.

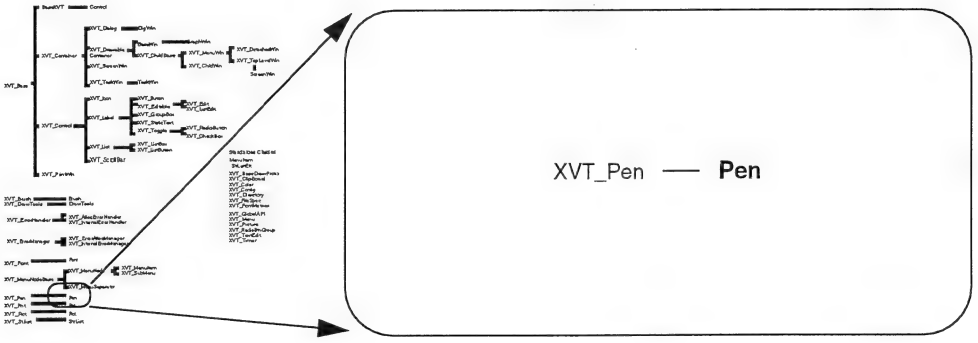
Equivalent C Function

`win_menu_check()`

Implementation Members

`class_name`

Pen



Overview

Header File	`ktool.hpp`
Source File	`ktool.cc`
Superclass	`XVT_Pen`
Subclasses	
Usage	Concrete

Instances of this class define how line drawing primitives are rendered in a window. Each window maintains an instance of this class.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_Pen` instead.

Constructors

```
Pen( COLOR clr = COLOR_BLACK, PAT_STYLE pat = PAT_SOLID,
    short wdth = 1 )
```

Member Functions

Pen::color

GET OR SET THE PEN'S COLOR

Prototypes

```
COLOR
color()

void
color(
        COLOR                   clr )
```

Parameters

`clr`
The pen's new color.

Return Value

`color()`
The pen's color.

Description

`color(clr)`
Sets the pen's color.

Pen::pat

GET OR SET THE PEN'S PATTERN

Prototypes

```
PAT_STYLE
pat()

void
pat(
        PAT_STYLE               p )
```

Parameters

`p`
The pen's new pattern.

Return Value

`pat()`
The pen's pattern.

Description

`pat( p )`
Sets the pen's pattern.

Pen::width

GET OR SET A PEN'S WIDTH

Prototypes

```
int
width()

void
width(
        short                   wdth )
```

Parameters

`wdth`
The pen's new width.

Return Value

`width()`
The pen's width.

Description

`width( short wdth )`
Sets the pen's width.

Implementation Members

`class_name`

Inherited Member Functions

From XVT_Pen

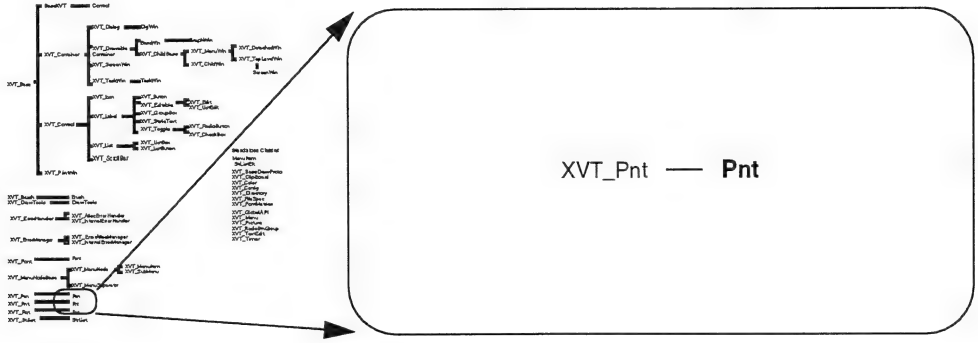
page 296 `XVT_Color GetColor()`

page 296 `PAT_STYLE GetPattern()`

page 296 `PEN_STYLE GetStyle()`

page 297 short GetWidth()
page 297 void SetColor(XVT_Color c)
page 297 void SetPattern(PAT_STYLE p)
page 298 void SetStyle(PEN_STYLE s)
page 299 void SetWidth(short w)

Pnt



Overview

Header File	`kpnt.hpp`
Source File	
Superclass	`XVT_Pnt`
Subclasses	
Usage	Concrete

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_Pnt` instead.

Constructors

```
Pnt( int x = 0, int y = 0 )
```

Member Functions

Pnt::set

SET A POINT'S X AND Y COORDINATES

Prototypes

```
Pnt
set(
        int                     x = 0,
        int                     y = 0 )
```

Parameters

x
: The point's new X coordinate.

y
: The point's new Y coordinate.

Return Value

The point.

Pnt::x

SET OR RETRIEVE THE POINT'S X COORDINATE

Prototypes

```
short
x()

void
x(
        int                     xx )
```

Parameters

xx
: The point's new X coordinate.

Return Value

`x()`
The point's current X coordinate.

Description

`x(xx)`
Sets the point's X coordinate.

Pnt::y

SET OR RETRIEVE THE POINT'S Y COORDINATE

Prototypes

```
short
y()

void
y(
        int                     yy )
```

Parameters

`yy`
The point's new Y coordinate.

Return Value

`y()`
The point's current Y coordinate.

Description

`y(yy)`
Set the point's Y coordinate

Implementation Members

`class_name`

Inherited Member Functions

From XVT_Pnt

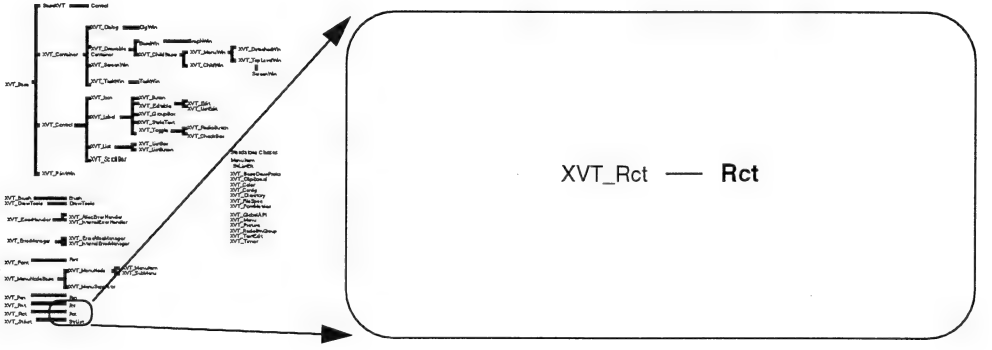
page 307 `short GetX( void )`

page 307 `short GetY( void )`

page 308 `void SetX( short pos )`

page 308 `void SetY( short pos )`

Rct



Overview

Header File	`krct.hpp`
Source File	
Superclass	`XVT_Rct`
Subclasses	
Usage	Concrete

Instances of this class model mathematical rectangles. This class is completely compatible with the XVT++ 1.1 class of the same name. It is included for backwards compatibility only. New applications should use the `XVT_Rct` class.

Constructors

```
Rct( int left, int top, int right, int bottom )
Rct( Pnt ul, Pnt lr )
Rct()
```

Member Functions

Rct::bottom

RETRIEVE THE BOTTOM EDGE OF THE RECTANGLE

Prototypes

```
int
bottom()
```

Return Value

The bottom edge of the rectangle.

Rct::empty

DETERMINE IF A RECTANGLE IS EMPTY

Prototypes

```
BOOLEAN
empty()
```

Return Value

A flag that is TRUE if the rectangle is empty, FALSE otherwise.

Equivalent C Function

```
is_rect_empty()
```

Rct::left

RETRIEVE THE LEFT EDGE OF THE RECTANGLE

Prototypes

```
int
left()
```

Return Value

The left edge of the rectangle.

Rct::right

RETRIEVE THE RIGHT EDGE OF THE RECTANGLE

Prototypes

```
int
right()
```

Return Value

The right edge of the rectangle.

Rct::set

SET A RECTANGLE'S DIMENSIONS

Prototypes

```
Rct
set(
        int                     left = 0,
        int                     top = 0,
        int                     right = 0,
        int                     bottom = 0 )

Rct
set(
        Pnt                     ul,
        Pnt                     lr )
```

Parameters

`left`
The left edge of the rectangle.

`top`
The top edge of the rectangle.

`right`
The right edge of the rectangle.

`bottom`
The bottom edge of the rectangle.

`ul`
The upper-left corner point of the rectangle.

`lr`
The lower-right corner point of the rectangle.

Return Value

A copy of the rectangle.

Description

Sets a rectangle's dimensions.

Equivalent C Function

```
set_rect()
set_rect_empty()
```

Rct::top

RETRIEVE THE TOP EDGE OF THE RECTANGLE

Prototypes

```
int
top()
```

Return Value

The top edge of the rectangle.

Implementation Members

```
class_name
```

Inherited Member Functions

From XVT_Rct

page 324 `XVT_Pnt Constrain( XVT_Pntpoint )`

page 325 `BOOLEAN Contains( XVT_Pnt point ) const`

page 325 `BOOLEAN Contains( XVT_Rct rect ) const`

page 326 `short Difference( XVT_Rct& boundary, XVT_Rct *list ) const`

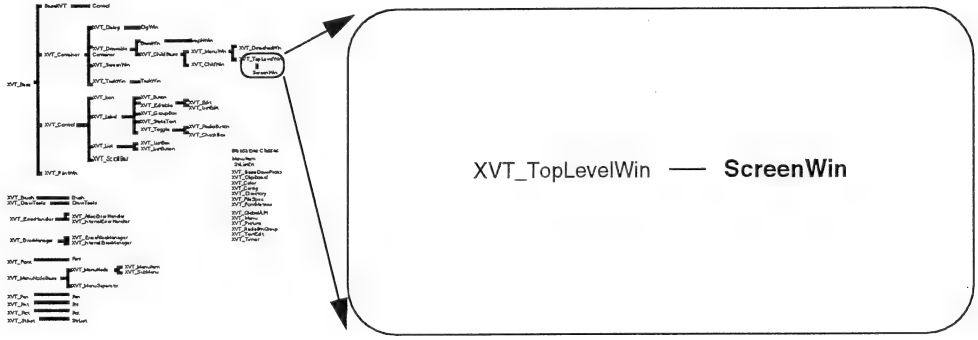
page 326 `virtual XVT_Pnt GetBottomLeft() const`

page 327 `virtual XVT_Pnt GetBottomRight() const`

page 327 `XVT_Pnt GetDimVect() const`

page 327 virtual XVT_Pnt GetTopLeft() const
page 328 virtual XVT_Pnt GetTopRight() const
page 328 short Height() const
page 328 BOOLEAN Intersect(XVT_Rct& boundary) const
page 329 BOOLEAN IsEmpty() const
page 329 XVT_Rct Normalize() const
page 330 void SetBottomLeft(XVT_Pnt point)
page 330 void SetBottomRight(XVT_Pnt point)
page 330 void SetTopLeft(XVT_Pnt point)
page 331 void SetTopRight(XVT_Pnt point)
page 331 XVT_Pnt TransToGlobal(XVT_Pnt point) const
page 332 XVT_Pnt TransToLocal(XVT_Pnt point) const
page 332 short Width() const

ScreenWin



Overview

Header File	`kscreen.hpp`
Source File	`kscreen.cc`
Superclass	`XVT_TopLevelWin`
Subclasses	
Usage	Abstract

In XVT++ 1.1, the `ScreenWin` class defined the interface to all non-task windows.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use either `XVT_TopLevelwin` or `XVT_DetachedWin` instead.

You use this class by creating a subclass that overrides virtual event handling member functions with implementations that actually do something in response to events.

Constructors

```
ScreenWin()
virtual ~ScreenWin()
```

Member Functions

The following functions are identical to those implemented by BaseXVT:

page 425 `virtual void disable()`

page 425 `virtual void enable( BOOLEAN enabled = TRUE )`

page 426 `WIN_DEF* get_def() const`

page 426 `Rct get_rect() const`

page 427 `virtual SSTR* get_text( char* buffer, int len ) const`

page 427 `WIN_TYPE get_type() const`

page 428 `virtual void hide()`

page 428 `virtual void move( Rct boundary )`

page 428 `WINDOW parent()`

page 429 `void put_def( WIN_DEF* in_def )`

page 429 `virtual void set_text( char* str)`

page 430 `virtual void show( BOOLEAN visible = TRUE )`

The following functions are identical to those implemented by BaseWin:

page 415 `long dispatch( EVENT* event)`

page 416 `virtual void e_command( MenuItem mi, BOOLEAN shift, BOOLEAN control )`

page 417 `virtual void e_control( int cid, CONTROL_INFO* info )`

page 418 `virtual void e_deactivate()`

page 416 `virtual void e_activate()`

page 418 `Rct get_client()`

page 419 `EVENT_MASK get_mask()`

page 419 `WINDOW get_win()`

page 420 `void set_mask( EVENT_MASK mask )`

page 420 `long set_timer( long interval )`

The following functions are identical to those implemented by `GraphWin`:

page 469 `void arc( Rct lrct, Pnt start, Pnt stop )`

page 470 `void clear()`

page 470 `DrawTools get_tools() const`

page 470 `void icon( Pnt p, int rid )`

page 471 `void line( Pnt from, Pnt to, BOOLEAN start_arrow = FALSE, BOOLEAN end_arrow = FALSE )`

page 472 `void move_to( Pnt p )`

page 472 `void oval( Rct r )`

page 473 `void pie( Rctr, Pnt start, Pnt stop )`

page 473 `void polygon( Pnt* points, int npoints )`

page 474 `void polyline( Pnt* points, int npoints )`

page 474 `void rectangle( Rct r )`

page 475 `void rounded_rectangle( Rct r, int oval_width, int oval_height )`

page 475 `void set_brush( Brush b )`

page 476 `void set_font( Font font )`

page 476 `void set_mode( DRAW_MODE mode )`

page 477 `void set_pen( Pen p )`

page 477 `void set_tools( DrawTools tools )`

page 478 `void text( Pnt p, SSTR* str, int i = -1 )`

ScreenWin::create

CREATE A WINDOW FROM RESOURCES

Prototypes

```
virtual BOOLEAN
create(
        int                     rid,
        long                    appdata = 0L )
```

Parameters

`rid`
The window resource ID.

`appdata`
The application data associated with this window.

Return Value

A flag that is `TRUE` if the operation succeeded, `FALSE` if it failed.

Description

Creates a window from resources.

Equivalent C Function

`create_res_window()`

ScreenWin::create_def

CREATE WINDOW FROM A WIN_DEF

Prototypes

```
virtual BOOLEAN
create_def(
        long                    appdata = 0L )
```

Parameters

`appdata`
The application data associated with this window.

Return Value

A flag that is `TRUE` if the operation succeeded, `FALSE` if it failed.

Description

Creates a window from the stored `WIN_DEF` structure.

Equivalent C Function

`create_def_window()`

ScreenWin::create_scratch

CREATE A WINDOW FROM PARAMETERS

Prototypes

```
virtual BOOLEAN
create_scratch(
        Rct             lrct,
        int             menu_rid,
        WIN_TYPE        wtype = W_DOC,
        SSTR*           title = "",
        long            win_flags = WSF_SIZE | WSF_CLOSE,
        long            appdata = 0L )
```

Parameters

`lrct`
The new window's client area.

`menu_rid`
The resource ID of the new window's menu.

`wtype`
The type of the new window.

`title`
The new window's title.

`win_flags`
The new window's attribute flags.

`appdata`
The new window's application data.

Return Value

A flag that is `TRUE` if the operation succeeded, `FALSE` if it failed.

Description

Creates a window specified by parameters.

Equivalent C Function

`create_window()`

ScreenWin::get_metrics

RETRIEVE THE CURRENT FONT METRICS

Prototypes

```
virtual void
get_metrics(
        int*                    leading,
        int*                    ascent,
        int*                    descent )
```

Parameters

`leading`
The leading of the current font.

`ascent`
The ascent of the current font.

`descent`
The descent of the current font.

Description

Retrieves the current font metrics.

Equivalent C Function

```
win_get_font_metrics()
```

ScreenWin::set_def

SET THE ASSOCIATED WIN_DEF FROM A RESOURCE

Prototypes

```
virtual BOOLEAN
set_def(
        int                     rid )
```

Parameters

`rid`
The resource ID from which to get the window definition.

Return Value

A flag that is `TRUE` if the operation succeeded, `FALSE` if it failed.

Description

Sets the associated WIN_DEF from a resource.

Equivalent C Function

get_res_window()

Implementation Members

class_name

Inherited Member Functions

From XVT_TopLevelWin

page 401
```
BOOLEAN Init(
WIN_TYPE wtype,
XVT_Rct boundary,
char* title,
long menu_rid,
long flags )
```

page 401
```
BOOLEAN Init( long rid )
```

From XVT_MenuWin

page 286
```
virtual void e_close()
```

page 287
```
virtual void e_font( XVT_Font font, FONT_PART part )
```

page 287
```
XVT_Menu *GetMenu()
```

page 288
```
void GetTitle( char *buffer, long len )
```

page 289
```
void SetDocTitle( char *str )
```

page 289
```
void SetFontMenu( XVT_Font font )
```

page 290
```
void SetMenu( XVT_Menu *menu )
```

page 291
```
void SetTitle( char *str )
```

From XVT_ChildBase

page 49
```
virtual void e_hscroll( SCROLL_CONTROL activity, short
pos )
```

page 49
```
virtual void e_vscroll( SCROLL_CONTROL activity, short
pos )
```

page 50
```
XVT_TextEdit* GetActiveTextEdit()
```

page 50 XVT_Pnt GetCaretPos() const

page 51 BOOLEAN GetCaretState() const

page 51 BOOLEAN GetEnabledState()

page 51 XVT_ChildBase *GetParent() const

page 52 long GetScrollPosition(SCROLL_TYPE scroll_type) const

page 52 long GetScrollProportion(SCROLL_TYPE scroll_type) const

page 53 void GetScrollRange(SCROLL_TYPE scroll_type, long *min, long *max) const

page 54 XVT_TextEdit* GetTextEdit(long id)

page 54 BOOLEAN GetVisibleState()

page 55 void MakeFront()

page 55 void ReleaseMouse()

page 56 void SetCaretDimensions(XVT_Pnt vector)

page 56 void SetCaretPos(XVT_Pnt point)

page 57 void SetCaretState(BOOLEAN state)

page 57 void SetCursor(CURSOR cursor)

page 58 void SetEnabledState(BOOLEAN state)

page 59 void SetScrollPosition(SCROLL_TYPE scroll_type, long position)

page 60 void SetScrollProportion(SCROLL_TYPE scroll_type, long proportion)

page 60 void SetScrollRange(SCROLL_TYPE scroll_type, long min, long max, long pos)

page 61 void SetVisibleState(BOOLEAN f)

page 62 void TrapMouse()

From XVT_DrawableContainer

page 129 void Clear()

page 129 void Clear(XVT_Color color)

page 129 void Close()

page 128 XVT_BaseDrawProto* DrawProtocol

page 130 virtual void e_char(
short chr,
BOOLEAN shift,
BOOLEAN control)

page 131 virtual void e_create()

page 132 virtual void e_destroy()

page 132 virtual void e_focus(BOOLEAN active)

page 133 virtual void e_mouse_dbl(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 134 virtual void e_mouse_down(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 135 virtual void e_mouse_move(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 135 virtual void e_mouse_up(
XVT_Pnt point,
BOOLEAN shift,
BOOLEAN control,
short button)

page 136 virtual void e_size(XVT_Rct boundary)

page 137 virtual void e_timer(long id)

page 137 virtual void e_update(XVT_Rct boundary)

page 139 virtual long e_user(long id, void *data)

page 140 XVT_Control *GetCtl(long cid)

page 140 long GetCtlCount()

page 141 EVENT_MASK GetEventMask() const

page 141 XVT_Control *GetFirstCtl()

page 142 XVT_ChildBase *GetFirstWin()

page 142 XVT_Control *GetNextCtl()

page 143 XVT_ChildBase *GetNextWin()

page 143 long GetWinCount()

page 144 void Invalidate()

page 144 void Invalidate(XVT_Rctregion)

page 145 void Scroll(
XVT_Rct boundary,
long dh,
long dv)

page 146 void SetEventMask(EVENT_MASK ask)

page 148 void SetInnerRect(XVT_Rct r)

From XVT_Base

page 11 virtual BaseWin* CastToBaseWin()

page 10 virtual DlgWin* CastToDlgWin()

page 10 virtual ScreenWin* CastToScreenWin11()

page 10 virtual TaskWin* CastToTaskWin11()

page 11 virtual XVT_Button *CastToButton()

page 11 virtual XVT_CheckBox *CastToCheckBox()

page 11 virtual XVT_ChildWin *CastToChildWin()

page 11 virtual XVT_DetachedWin *CastToDetachedWin()

page 11 virtual XVT_Dialog *CastToDialog()

page 11 virtualXVT_DrawableContainer*CastToDrawableContainer()

page 11 virtual XVT_Edit *CastToEdit()

page 11 virtual XVT_GroupBox *CastToGroupBox()

page 11 virtual XVT_Icon *CastToIcon()

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

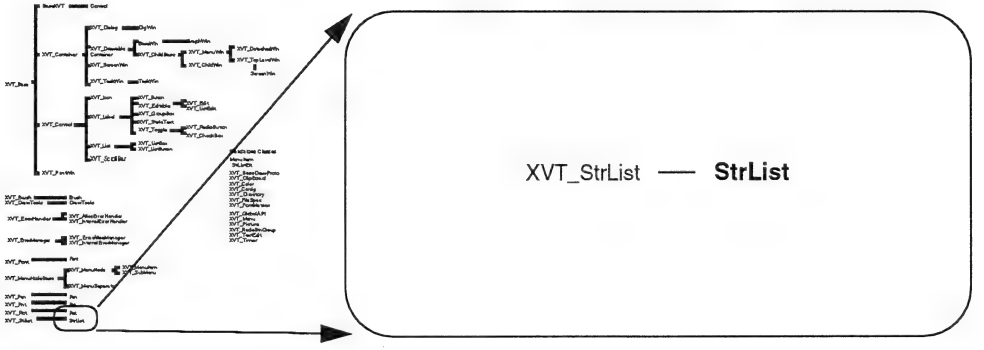
page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

StrList



Overview

Header File	`kslist.hpp`
Source File	`kslist.cc`
Superclass	`XVT_StrList`
Subclasses	
Usage	Concrete

Instances of this class represent lists of strings.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is included for backwards compatibility only. New programs should use `XVT_StrList` instead.

Constructors

```
StrList( SLIST x = NULL )
~StrList()
```

Member Functions

StrList::add

ADD AN ELEMENT OR ELEMENTS TO THE LIST

Prototypes

```
BOOLEAN
add(
        StrListElt          e,
        char*               sx,
        long                data = 0 )

BOOLEAN
add(
        char*               sx,
        long                data = 0 )
```

Parameters

`e`
The element before which to add the new element(s).

`sx`
Either a character string or an (`SLIST*`).

`data`
The data portion of the new element.

`unique`
A flag that is `TRUE` if only unique elements are to be added to the list, `FALSE` if not.

`case_sensitive`
A flag that is `TRUE` if element comparisons are to be case-sensitive, `FALSE` if case is to be ignored.

Return Value

A flag that is `TRUE` if the operation succeeded, `FALSE` if it failed.

Description

Adds an element or elements to the list.

`add( e, sx, data )`
Adds an element or elements to the list immediately in front of the element `e`.

`add( sx, data )`
Adds an element or elements to the end of the list.

Equivalent C Function

```
slist_add()
```

StrList::add_sorted

ADD AN ELEMENT TO A STRING LIST IN ORDER

Prototypes

```
void
add_sorted(
        char*               str,
        long                data = 0L,
        BOOLEAN             unique = FALSE,
        BOOLEAN             case_sensitive = FALSE )
```

Parameters

`str`
The string portion of the element to add.

`data`
The data portion of the element to add.

`unique`
A flag that is `TRUE` if duplicate elements are not to be added to the string list, `FALSE` if they are.

`case_sensitive`
A flag that is `TRUE` if element comparisons are to be case-sensitive, `FALSE` if they are to ignore case.

Description

Adds an element to a string list in lexicographic order.

StrList::count

RETRIEVE THE NUMBER OF ELEMENTS IN A LIST

Prototypes

```
int
count()
```

Return Value

The number of items in the list.

Equivalent C Function

```
slist_count()
```

StrList::dbg

DUMP A STRING LIST TO THE DEBUG FILE

Prototypes

```
void
dbg()
```

Description

Dumps a string list to the debug file.

Equivalent C Function

```
slist_dbg()
```

StrList::elt

RETRIEVE THE CONTENTS OF A STRING LIST ELEMENT

Prototypes

```
char*
elt(
        int             index,
        long*           datap = NULL )
```

Parameters

`index`
The index of the element to retrieve.

`datap`
Storage to receive the element data.

Return Value

The string portion of the element.

Equivalent C Function

```
slist_elt()
```

StrList::first

BEGIN A TRAVERSAL OF THE STRING LIST

Prototypes

```
StrListElt
first()
```

Return Value

The first element in the list.

Description

Begins a traversal of the string list.

Equivalent C Function

```
slist_first()
```

StrList::get

RETRIEVE AN ELEMENT IN A LIST

Prototypes

```
char*
get(
        StrListElt          e,
        long*               datap = NULL )
```

Parameters

`e`
The element to retrieve.

`datap`
Storage to receive the element data.

Return Value

The string portion of the element.

Description

Retrieves an element in a list.

Equivalent C Function

```
slist_get()
```

StrList::next

RETRIEVE THE NEXT ELEMENT IN A STRING LIST

Prototypes

```
StrListElt
next(
        StrListElt              e )
```

Parameters

e
The list element.

Return Value

The list element, e.

Description

Retrieves the next element in a string list.

Equivalent C Function

```
slist_next()
```

StrList::rem

REMOVE AN ELEMENT FROM A STRING LIST

Prototypes

```
BOOLEAN
rem(
        StrListElt              e )
```

Parameters

e
The element to be removed.

Return Value

A flag that is TRUE if the operation succeeded, FALSE if not.

Description

Removes an element from a string list.

Equivalent C Function

```
slist_rem()
```

StrList::valid

DETERMINE IF A STRING LIST IS VALID

Prototypes

```
BOOLEAN
valid()
```

Return Value

A flag that is TRUE if the list is a valid list, FALSE if not.

Description

Determines if a string list is valid.

Equivalent C Function

```
slist_valid()
```

Implementation Members

```
class_name
```

Inherited Member Functions

From XVT_StrList

page 350 `void Add( long element, char* str, long data = 0L )`

page 350 `void Add( long element, XVT_StrList* sl )`

page 350 `void Add( char* ch, long data = 0L )`

page 350 `void Add( XVT_StrList* sl )`

page 351 `void AddSorted( char* str, long data = 0L, BOOLEAN unique = FALSE, BOOLEAN case_sensitive = FALSE )`

page 352 `long Count()`

page 352 `void Debug()`

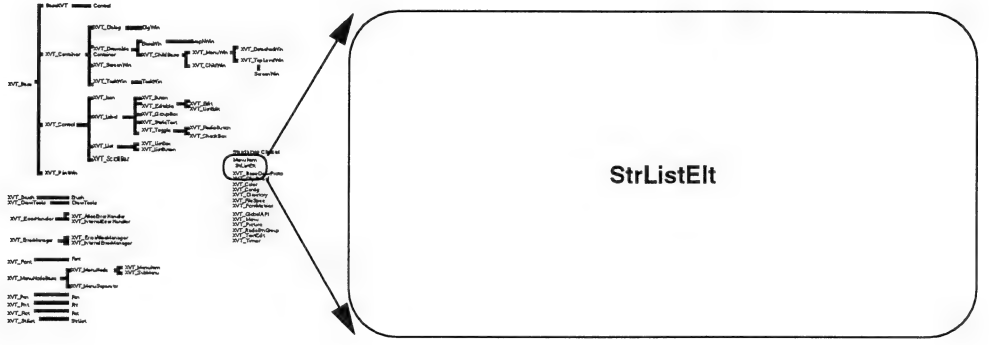
page 353 BOOLEAN GetElement(long index, const char** str, long* data) const;

page 353 BOOLEAN GetFirst(const char** str, long* data, long* index = 0)

page 354 BOOLEAN GetNext(const char** str, long* data)

page 355 void Remove(long index)

StrListElt



Overview

Header File	`kslist.hpp`
Source File	`kslist.cc`
Superclass	
Subclasses	
Usage	Concrete

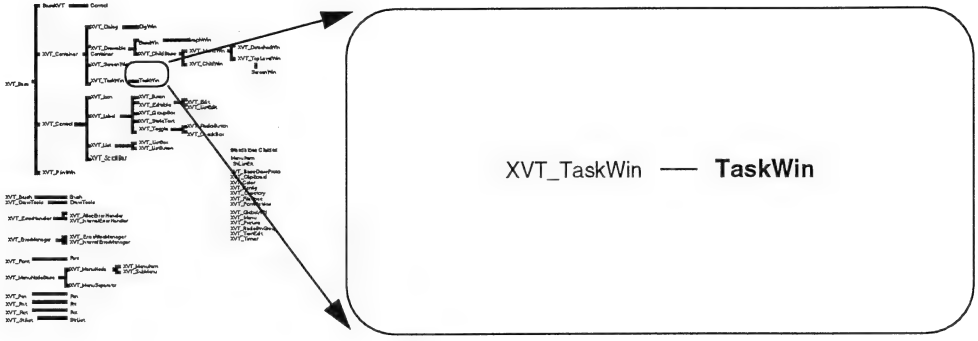
This class simply defines an opaque context object that gives a location in a string list. The application developer never instantiates this class; instances are created as needed by the `StrList` class.

This class is completely compatible with the XVT++ 1.1 class of the same name. It is included for backwards compatibility only. New applications should use `XVT_StrList`, which does not expose a context class.

Implementation Members

`class_name`

TaskWin



Overview

Header File	`ktask.hpp`
Source File	`ktask.cc`
Superclass	`XVT_TaskWin`
Subclasses	
Usage	Abstract

The `TaskWin` class defines the interface to the task window.

This class is completely compatible with the XVT++ 1.1 class of the same name. This class is provided for backwards compatibility only. For new applications, we recommend that you use `XVT_TaskWin` instead.

You use this class by creating a subclass that overrides the virtual event handling member functions with implementations that actually do something in response to events.

Constructors

```
TaskWin()
~TaskWin()
```

Member Functions

The following functions are identical to those implemented by BaseXVT:

page 425 virtual void disable()

page 425 virtual void enable(BOOLEAN enabled = TRUE)

page 426 WIN_DEF* get_def() const

page 426 Rct get_rect() const

page 427 virtual SSTR* get_text(char* buffer, int len)

page 427 WIN_TYPE get_type() const

page 428 virtual void hide()

page 428 virtual void move(Rct boundary)

page 428 WINDOW parent()

page 429 void put_def(WIN_DEF* In_def)

page 429 virtual void set_text(char* str)

page 430 virtual void show(BOOLEAN visible = TRUE)

The following functions are identical to those implemented by BaseWin:

page 416 virtual void e_activate()

page 416 virtual void e_command(MenuItem mi, BOOLEAN shift, BOOLEAN control)

page 417 virtual void e_control(int cid, CONTROL_INFO* info)

page 418 virtual void e_deactivate()

page 415 long dispatch(EVENT* event)

page 418 Rct get_client() const

page 419 EVENT_MASK get_mask() const

page 419 WINDOW get_win() const

page 419 void set_font(Font, BOOLEAN)

page 420 void set_mask(EVENT_MASK mask)

page 420 long set_timer(long interval)

TaskWin:: begin

START AN XVT++ APPLICATION

Prototypes

```
virtual void
begin(
        int                     argc,
        char*                   argv[],
        long                    flags = 0L,
        XVT_CONFIG*             config = NULL )
```

Parameters

`argc`
The number of entries in the `argv` array.

`argv`
The array of argument words, null terminated.

`flags`
Not used.

`config`
Application configuration data.

Return Value

Never returns.

Description

Starts an XVT++ application.

Equivalent C Function

`xvt_system()`

TaskWin:: get_config

RETRIEVE APPLICATION CONFIGURATION DATA

Prototypes

```
virtual XVT_CONFIG*
get_config() const
```

Return Value

The configuration data passed into `begin`.

Description

Retrieves application configuration data.

Inherited Member Functions

From XVT_TaskWin

page 362 `void Close()`

page 363 `virtual void e_close()`

page 363 `virtual void e_create()`

page 364 `virtual void e_destroy()`

page 364 `virtual BOOLEAN e_quit( BOOLEAN query_only )`

page 366 `virtual void Init( int argc, char *argv[], unsigned long flags, XVT_Config config )`

page 367 `virtual BOOLEAN QuitOK()`

From XVT_Base

page 11 `virtual BaseWin* CastToBaseWin()`

page 10 `virtual DlgWin* CastToDlgWin()`

page 10 `virtual ScreenWin* CastToScreenWin11()`

page 10 `virtual TaskWin* CastToTaskWin11()`

page 11 `virtual XVT_Button *CastToButton()`

page 11 `virtual XVT_CheckBox *CastToCheckBox()`

page 11 `virtual XVT_ChildWin *CastToChildWin()`

page 11 `virtual XVT_DetachedWin *CastToDetachedWin()`

page 11 `virtual XVT_Dialog *CastToDialog()`

page 11 `virtualXVT_DrawableContainer*CastToDrawableContainer()`

page 11 `virtual XVT_Edit *CastToEdit()`

page 11 `virtual XVT_GroupBox *CastToGroupBox()`

page 11 `virtual XVT_Icon *CastToIcon()`

page 11 virtual XVT_ListBox *CastToListBox()

page 11 virtual XVT_ListButton *CastToListButton()

page 11 virtual XVT_ListEdit *CastToListEdit()

page 11 virtual XVT_MenuWin *CastToMenuWin()

page 11 virtual XVT_PrintWin *CastToPrintWin()

page 11 virtual XVT_RadioButton *CastToRadioButton()

page 11 virtual XVT_ScreenWin *CastToScreenWin()

page 11 virtual XVT_ScrollBar *CastToScrollBar()

page 11 virtual XVT_StaticText *CastToStaticText()

page 11 virtual XVT_TaskWin *CastToTaskWin()

page 11 virtual XVT_TopLevelWin *CastToTopLevelWin()

page 12 virtual XVT_Rct GetInnerRect()

page 13 virtual XVT_Rct GetOuterRect()

XVT++

INDEX OF EQUIVALENT C FUNCTIONS

A

about_box()
XVT_GlobalAPI::About, 183

C

caret_off()
XVT_ChildBase::SetCaretState, 57
caret_on()
XVT_ChildBase::SetCaretPos, 57
XVT_ChildBase::SetCaretState, 57
cb_close()
XVT_ClipBoard::GetData, 77
XVT_ClipBoard::PutData, 79
cb_format_avail()
XVT_ClipBoard::FormatAvail, 76
cb_free()
XVT_ClipBoard::GetData, 77
XVT_ClipBoard::PutData, 79
cb_get()
XVT_ClipBoard::GetData, 77
cb_malloc
()XVT_ClipBoard::GetData, 77
cb_malloc()
XVT_ClipBoard::PutData, 79
cb_open()
XVT_ClipBoard::GetData, 77
XVT_ClipBoard::PutData, 79
cb_put()
XVT_ClipBoard::PutData, 79
chg_dir()
XVT_GlobalAPI::ChgDir, 185
clear_window()
XVT_DrawableContainer::Clear, 129
close_window()
XVT_Control::Close, 93
XVT_Dialog::Close, 109
XVT_DrawableContainer::Close, 130
XVT_TaskWin::Close, 363
create_control()
XVT_Control::Init, 96
XVT_Icon::Init, 231
XVT_Label::Init, 240
XVT_ScrollBar::Init, 341
create_def_control()
XVT_Control::Init, 96
XVT_Icon::Init, 231
XVT_Label::Init, 240
XVT_ScrollBar::Init, 341
create_def_dialog()
XVT_Dialog::Init, 119
create_def_window()
XVT_ChildWin::Init, 68
XVT_DetachedWin::Init, 103
XVT_TopLevelWin::Init, 403
create_res_dialog()
XVT_Dialog::Init, 119

create_res_window()
XVT_ChildWin::Init, 68
XVT_DetachedWin::Init, 103
XVT_TopLevelWin::Init, 403
create_window()
XVT_ChildWin::Init, 68
XVT_DetachedWin::Init, 103
XVT_TopLevelWin::Init, 403

D

dbg2()
XVT_GlobalAPI::Debug2, 186
dir_to_str()
XVT_Directory::DirToStr, 126

E

enable_window()
XVT_ChildBase::SetEnabledState, 59
XVT_Control::SetEnabledState, 97
XVT_Dialog::SetEnabledState, 120

F

find_eol()
XVT_GlobalAPI::FindEOL, 188

G

galloc()
XVT_GlobalAPI::GAlloc, 190
get_client_rect()
XVT_Base::GetInnerRect, 12
get_clip()
XVT_BaseDrawProto::GetClip, 26
get_ctl_window()
XVT_Control::GetID, 95
get_default_dir()
XVT_GlobalAPI::GetDefaultDir, 192
get_dialog_userdata()
XVT_GlobalAPI::GetDialogUserData, 193
get_dir()
XVT_GlobalAPI::GetDir, 194
get_event_mask()
XVT_Dialog::GetEventMask, 116
XVT_DrawableContainer::GetEventMask, 141
get_front_top_level_window()
XVT_GlobalAPI::GetDefaultBackColor, 191
XVT_GlobalAPI::GetFrontTopLevelWin, 191
get_front_window()
XVT_GlobalAPI::GetFrontWin, 192
get_menu_userdata()
XVT_GlobalAPI::GetMenuUserData, 195
get_outer_rect()
XVT_Base::GetOuterRect, 13
get_parent()
XVT_ChildBase::GetParent, 52
XVT_Control::GetParent, 95
get_res_str()
XVT_GlobalAPI::GetResString, 195
get_scroll_pos()
XVT_ChildBase::GetScrollPosition, 52
get_scroll_proportion()
XVT_ChildBase::GetScrollProportion, 53
XVT_ScrollBar::GetScrollProportion, 340
get_scroll_range()
XVT_ChildBase::GetScrollRange, 54
XVT_ScrollBar::GetScrollPosition, 339
XVT_ScrollBar::GetScrollRange, 340
get_str_response()
XVT_GlobalAPI::Response, 206
get_title()
XVT_Dialog::GetTitle, 118
XVT_Label::GetTitle, 239
XVT_MenuWin::GetTitle, 288
get_tx_edit
XVT_ChildBase::GetTextEdit, 54
get_value(ATTR_PS_PRINT_FILE_NAME)
XVT_PrintWin::GetOutputFile, 313
get_value()
XVT_GlobalAPI::GetAttrValue, 191
get_window_type()
XVT_Base::GetType, 14
get_window_userdata()
XVT_GlobalAPI::GetWindowUserData, 196

gfree()
XVT_GlobalAPI::GFree, 197
glock()
XVT_GlobalAPI::GLock, 197
grealloc()
XVT_GlobalAPI::GReAlloc, 198
gsize()
XVT_GlobalAPI::GSize, 199
gunlock()
XVT_GlobalAPI::GUnLock, 199

I

invalidate_rect()
XVT_DrawableContainer::Invalidate, 144
is_rect_empty()
XVT_Rct::IsEmpty, 329

L

list_faces()
XVT_GlobalAPI::ListFaces, 200
list_res_str()
XVT_GlobalAPI::ListResStrings, 201
list_windows()
XVT_DrawableContainer::GetNextWin, 143
XVT_ScreenWin::GetNextWin, 335

M

move_window()
XVT_Control::SetInnerRect, 98
XVT_Dialog::SetInnerRect, 122
XVT_DrawableContainer::SetInnerRect, 148

N

needs_update()
XVT_BaseDrawProto::NeedsUpdate, 30

O

open_file_dlg()
XVT_GlobalAPI::OpenFile, 203

P

page_setup_dlg()
XVT_GlobalAPI::PageSetup, 204
picture_close()
XVT_Picture::Close, 302
picture_lock()
XVT_Picture::GetOpaqueData, 303
XVT_Picture::GetOpaqueDataSize, 303
XVT_Picture::Lock, 304
picture_unlock()
XVT_Picture::GetOpaqueData, 303
XVT_Picture::Unlock, 305
process_events()
XVT_GlobalAPI::ProcessEvents, 205
pt_in_rect()
XVT_Rct::Contains, 325

R

rect_intersect()
XVT_Rct::Intersect, 329
release_mouse()
XVT_ChildBase::ReleaseMouse, 55
restore_dir()
XVT_GlobalAPI::RestoreDir, 207

S

save_dir()
XVT_GlobalAPI::SaveDir, 207
save_file_dlg()XVT_GlobalAPI::SaveFile, 208
set_caret_dimensions()
XVT_ChildBase::SetCaretDimensions, 56
set_clip()
XVT_BaseDrawProto::SetClip, 32
set_cursor()
XVT_ChildBase::SetCursor, 58
set_doc_title()
XVT_MenuWin::SetDocTitle, 289
set_event_mask()
XVT_Dialog::SetEventMask, 121
XVT_DrawableContainer::SetEventMask, 147
set_front_window()
XVT_ChildBase::MakeFront, 55
XVT_Control::MakeFront, 97
set_scroll_pos()
XVT_ChildBase::SetScrollPosition, 59
XVT_ScrollBar::SetScrollPosition, 342

set_scroll_proportion()
XVT_ChildBase::SetScrollProportion, 60
XVT_ScrollBar::SetScrollProportion, 343
set_scroll_range()
XVT_ChildBase::SetScrollRange, 61
XVT_ScrollBar::SetScrollRange, 344
set_title()
XVT_Dialog::SetTitle, 122
XVT_Label::SetTitle, 241
XVT_MenuWin::SetTitle, 291
set_value(ATTR_PS_PRINT_FILE_NAME)
XVT_PrintWin::SetOutputFile, 315
set_value()
XVT_GlobalAPI::SetAttrValue, 223
show_window()
XVT_ChildBase::SetVisibleState, 62
XVT_Control::SetVisibleState, 98
XVT_Dialog::SetVisibleState, 123
slist_add()
XVT_StrList::Add, 351
slist_add_sorted()
XVT_StrList::AddSorted, 352
slist_count()
XVT_StrList::Count, 352
slist_dbg()
XVT_StrList::Debug, 352
slist_elt()
XVT_StrList::GetElement, 353
slist_first()
XVT_StrList::GetFirst, 354
slist_next()
XVT_StrList::GetNext, 355
slist_rem()
XVT_StrList::Remove, 355
start_print_thread()
XVT_PrintWin::Init, 314
startup_dir()
XVT_GlobalAPI::StartupDir, 224

T

translate_points()
XVT_GlobalAPI::TranslatePoints, 225
trap_mouse()
XVT_ChildBase::TrapMouse, 62
tx_add_par()
XVT_TextEdit::AddPar, 372
tx_append()
XVT_TextEdit::Append, 372
tx_clear()
XVT_TextEdit::Clear, 373
tx_create()
XVT_TextEdit::Init, 383
tx_def_create()
XVT_TextEdit::Init, 383
tx_del_par()
XVT_TextEdit::DelPar, 374
tx_destroy()
XVT_TextEdit::Close, 373
tx_get_active()
XVT_ChildBase::GetActiveTextEdit, 50
tx_get_attrib() const
XVT_TextEdit::GetAttrib, 375
tx_get_border()
XVT_TextEdit::GetBorder, 375
tx_get_font()
XVT_TextEdit::GetFont, 376
tx_get_limit()
XVT_TextEdit::GetLimit, 376
tx_get_line()
XVT_TextEdit::GetLine, 377
tx_get_margin()
XVT_TextEdit::GetMargin, 377
tx_get_num_chars()
XVT_TextEdit::GetNumChars, 378
tx_get_num_lines()
XVT_TextEdit::GetNumLines, 378
tx_get_num_par_lines()
XVT_TextEdit::GetNumParLines, 379
tx_get_num_pars()
XVT_TextEdit::GetNumPars, 379
tx_get_origin()
XVT_TextEdit::GetOrigin, 380
tx_get_sel()
XVT_TextEdit::GetSel, 381

tx_get_view()
XVT_TextEdit::GetView, 381
tx_reset()
XVT_TextEdit::Reset, 384
tx_resume()
XVT_TextEdit::Resume, 384
tx_set_active()
XVT_TextEdit::SetActive, 385
tx_set_attrib()
XVT_TextEdit::SetAttrib, 385
tx_set_border()
XVT_TextEdit::SetBorder, 386
tx_set_colors()
XVT_TextEdit::SetColors, 386
tx_set_font()
XVT_TextEdit::SetFont, 387
tx_set_limit()
XVT_TextEdit::SetLimit, 387
tx_set_margin()
XVT_TextEdit::SetMargin, 388
tx_set_par()
XVT_TextEdit::SetPar, 388
tx_set_sel()
XVT_TextEdit::SetSel, 389
tx_suspend()
XVT_TextEdit::Suspend, 389
tx_vscroll()
XVT_TextEdit::DoVscroll, 375

U

update_window()
XVT_BaseDrawProto::UpdateWindow, 36

W

win _move_to()
XVT_BaseDrawProto::SetCurrentPoint, 33
win_check_box()
XVT_CheckBox::SetCheckedState, 45
win_check_radio_button()
XVT_RadioButton::SetCheckedState, 320
win_draw_aline()
XVT_BaseDrawProto::DrawALine, 16
win_draw_arc()
XVT_BaseDrawProto::DrawArc, 17
win_draw_icon()
XVT_BaseDrawProto::DrawIcon, 18
win_draw_line()
XVT_BaseDrawProto::DrawLine, 19
win_draw_oval()
XVT_BaseDrawProto::DrawOval, 20
win_draw_pie()
XVT_BaseDrawProto::DrawPie, 21
win_draw_polygon()
XVT_BaseDrawProto::DrawPolygon, 22
win_draw_polyline()
XVT_BaseDrawProto::DrawPolyLine, 23
win_draw_rect()
XVT_BaseDrawProto::DrawRect, 24
win_draw_round_rect()
XVT_BaseDrawProto::DrawRoundedRect, 25
win_draw_text()
XVT_BaseDrawProto::DrawText, 26
win_get_draw_ctools()
XVT_BaseDrawProto::GetBrush, 26
XVT_BaseDrawProto::GetDrawMode, 27
XVT_BaseDrawProto::GetDrawTools, 28
XVT_BaseDrawProto::GetPen, 29
win_get_font_metrics()
XVT_BaseDrawProto::GetFontMetrics, 28
win_get_text_width()
XVT_BaseDrawProto::GetTextWidth, 29
win_list_add()
XVT_List::Add, 245
XVT_ListEdit::Add, 264
win_list_clear()
XVT_List::Clear, 245
win_list_count_all()
XVT_List::CountAll, 245
win_list_count_sel()
XVT_List::CountSelections, 246
win_list_delete()
XVT_List::Delete, 246

win_list_get_all()
XVT_List::GetAll, 247
win_list_get_elt()
XVT_List::GetElement, 247
win_list_get_first_sel()
XVT_List::GetFirstSelection, 248
win_list_get_sel()
XVT_List::GetSelections, 249
win_list_get_sel_index()
XVT_List::GetSelectionIndex, 249
win_list_is_sel()
XVT_List::GetSelectedState, 249
win_list_resume()
XVT_ListBox::SetSuspendedState, 255
win_list_set_sel()
XVT_List::SetSelectedState, 251
win_list_suspend()
XVT_ListBox::SetSuspendedState, 255
win_menu_check()
XVT_MenuItem::SetCheckedState, 275
win_menu_enable()
XVT_MenuNode::SetEnabledState, 279
win_menu_fetch()
XVT_MenuWin::GetMenu, 288
win_menu_show()
XVT_MenuWin::SetMenu, 290
win_picture_draw()
XVT_BaseDrawProto::DrawPicture, 21
win_scroll_rect()
XVT_DrawableContainer::Scroll, 146
win_select_item_text()
XVT_Editable::SelectText, 163
win_set_back_color()
XVT_BaseDrawProto::SetBackColor, 31
win_set_cbrush()
XVT_BaseDrawProto::SetBrush, 31
win_set_cpen()
XVT_BaseDrawProto::SetPen, 36
win_set_draw_ctools()
XVT_BaseDrawProto::SetDrawTools, 34
win_set_draw_mode()
XVT_BaseDrawProto::SetDrawMode, 34
win_set_font()
XVT_BaseDrawProto::SetFont, 35
win_set_font_menu()
XVT_MenuWin::SetFontMenu, 290
win_set_fore_color()
XVT_BaseDrawProto::SetForeColor, 35
win_set_menu_text()
XVT_MenuNode::SetTitle, 280

X

xvt_ask()
XVT_GlobalAPI::Ask, 184
xvt_beep()
XVT_GlobalAPI::Beep, 185
xvt_dbg()
XVT_GlobalAPI::Debug, 186
xvt_error()
XVT_GlobalAPI::Error, 187
xvt_fatal()
XVT_GlobalAPI::Fatal, 187
xvt_help()
XVT_GlobalAPI::Help, 200
xvt_msg()
XVT_GlobalAPI::Message, 202
xvt_note()
XVT_GlobalAPI::Note, 202
xvt_system()
XVT_TaskWin::Init, 366
xvt_terminate()
XVT_TaskWin::Close, 363

XVT++

GENERAL INDEX

.frl file, 88
.hlp file, 88
.uid file, 88
_ScreenWin
    from XVT_Base, 11, 333
_TaskWin
    from XVT_Base, 12

A

About
    from XVT_GlobalAPI, 183
about box dialog
    displaying, 183
    retrieving resource ID, 85
    setting resource ID, 87
abstract class, vi
accelerator key, 278
Activity
    from XVT_TextEdit, 371
Add
    from XVT_List, 244
    from XVT_ListEdit, 263
    from XVT_StrList, 350
add
    from StrList, 510
adding
    item to list, 244, 263, 510
    item to list box, 442
    item to string list, 350
    item to string list in order, 351, 511
    paragraph to text edit object, 371
    string to paragraph, 372
AddPar
    from XVT_TextEdit, 371
AddSorted
    from XVT_StrList, 351
alert box, displaying, 186, 187, 202
allocating global memory, 189
AnotherPage
    from XVT_PrintWin, 311
Append
    from XVT_TextEdit, 372
appending
    debug information, 185
    debug information, conditionally, 186
    string list to debug file, 352
application
    closing, 362
    error, 187
    notifying object of creation, 363
    notifying object of exit, 364
    retrieving base name, 86
    retrieving name, 85
    setting base name, 88
    setting name, 88
    starting, 520

arc
drawing, 17, 469
from GraphWin, 469
area, invalidating, 144
ascent
retrieving, 28, 179
setting, 180
ASCII characters, 26, 75, 110, 130
Ask
from XVT_GlobalAPI, 183
aspect ratio, 20
ATTR_* constants, 209
ATTR_BACK_COLOR, 210
ATTR_CH_*, 209
ATTR_CTL_BUTTON_HEIGHT, 211
ATTR_CTL_CHECK_BOX_HEIGHT, 211
ATTR_CTL_EDIT_TEXT_HEIGHT, 211
ATTR_CTL_HORZ_SBAR_HEIGHT, 212
ATTR_CTL_RADIOBUTTON_HEIGHT, 212
ATTR_CTL_STATIC_TEXT_HEIGHT, 212
ATTR_CTL_VERT_SBAR_WIDTH, 213
ATTR_DBLFRAME_HEIGHT, 213
ATTR_DBLFRAME_WIDTH, 213
ATTR_DEBUG_FILENAME, 213
ATTR_DOC_STAGGER_HORZ, 214
ATTR_DOC_STAGGER_VERT, 215
ATTR_DOCFRAME_HEIGHT, 214
ATTR_DOCFRAME_WIDTH, 214
ATTR_EVENT_HOOK, 215
ATTR_FATAL_ERR_HANDLER, 215
ATTR_FRAME_HEIGHT, 216
ATTR_FRAME_WIDTH, 216
ATTR_HAVE_COLOR, 216
ATTR_HAVE_MOUSE, 217
ATTR_ICON_HEIGHT, 217
ATTR_ICON_WIDTH, 217
ATTR_KEY_HOOK, 218
ATTR_MAC_*, 209
ATTR_MALLOC_ERR_HANDLER, 218
ATTR_MENU_HEIGHT, 219
ATTR_NATIVE_GRAPHIC_CONTEXT, 219
ATTR_NATIVE_WINDOW, 220
ATTR_NUM_TIMERS, 220
ATTR_PM_*, 209
ATTR_PRINTER_HEIGHT, 220
ATTR_PRINTER_HRES, 221
ATTR_PRINTER_VRES, 221
ATTR_PRINTER_WIDTH, 221
ATTR_SCREEN_HEIGHT, 222
ATTR_SCREEN_HRES, 222
ATTR_SCREEN_VRES, 222
ATTR_SCREEN_WIDTH, 222
ATTR_SUPPRESS_UPDATE_CHECK, 223
ATTR_TITLE_HEIGHT, 223
ATTR_WIN_*, 209
ATTR_WIN_PM_*, 210
ATTR_X_*, 210
ATTR_XM_*, 210
ATTR_XOL_*, 210
ATTR_KEY_HOOK, 110, 131
ATTR_MALLOC_ERR_HANDLER, 9
attribute
retrieving, 190
setting, 208

B

background color
retrieving, 151, 191
setting, 30, 153
BaseWin class, 3, 414
BaseXVT class, 424
Beep
from XVT_GlobalAPI, 184
begin
from TaskWin, 520
behavior objects, 2
blue
retrieving color component, 81
setting color component, 82
bottom
from Rct, 494

boundary, retrieving for client area, 12
breaking array into lines, 188
brush
converting, 433
from Brush, 433
from DrawTools, 460
retrieving, 26, 151, 460
retrieving color, 38
retrieving pattern, 38
setting, 31, 154, 460, 475
setting color, 39
setting pattern, 39
Brush class, 432
button, notifying object of, 42

C

caret
retrieving position, 50
retrieving visibility, 51
setting dimensions, 56
setting position, 56
cast, vii, 10
CB_* formats, 75
CBRUSH structure, 433
CCHELP, 199
changing directory, 185
character input, notifying object, 109, 130
check
from Control, 437
from Font, 464
check box
checking, 45
determining if checked, 441
unchecking, 45
checkbox
checking, 437
unchecking, 451
checking
check box, 45
checkbox, 437
menu item, 275, 483
radio button, 437
ChgDir
from XVT_GlobalAPI, 185
child window
initializing, 67
retrieving, 334
retrieving first of, 142
retrieving next, 143, 334
retrieving number, 143, 335
class heirarchy, 3
Clear, 154, 210
from XVT_BaseDrawProto, 129
from XVT_List, 245
from XVT_TextEdit, 373
clear
from GraphWin, 470
clearing a window, 129, 470
client area
retrieving, 418
retrieving boundary, 12
clipboard
closing, 74
determining if format available, 74
determining if open, 77
opening, 77
putting data on, 78
retrieving data, 76
clipping, 32
retrieving state, 27
setting state, 32
clipping region
retrieving, 26
setting, 31
Close, 111, 286
from XVT_ClipBoard, 74
from XVT_Control, 92
from XVT_Dialog, 109
from XVT_DrawableContainer, 129
from XVT_Picture, 302
from XVT_TaskWin, 362
from XVT_TextEdit, 373

close
from BaseXVT, 425
from Control, 438
notifying object of request, 111, 286
closing
application, 362
clipboard, 74
notifying object, 363
object, 425
code, typesetting convention, v
color
from Brush, 434
from Pen, 487
retrieving background, 151, 191
retrieving blue component, 81
retrieving for brush, 38, 434
retrieving for pen, 296, 487
retrieving foreground, 152
retrieving green component, 81
retrieving red component, 82
setting background, 30, 153
setting blue component, 82
setting for brush, 39, 434
setting for pen, 297, 487
setting foreground, 35, 155
setting green component, 82
setting red component, 83
compatibility
1.1 classes, 407
discussion of, 3
concrete class, vi
configuration data, retrieving, 520
Constrain
from XVT_Rct, 62, 324
constraining point to a rectangle, 324
constructor, vii
container
notifying object of creation, 131
notifying object of destruction, 132
retrieving event mask, 141
setting event mask, 146
Contains
from XVT_Rct, 325
control
creating, 438, 439
destroying, 92, 438
determining visibility, 96
determining whether enabled, 95
disabling, 97
enabling, 97
initializing, 96
notifying object of, 417
notifying object of creation, 93
notifying object of destruction, 93
notifying object of user-defined event, 94
retrieving, 115
retrieving first, 141
retrieving first in a dialog, 117
retrieving next, 142
retrieving number, 116, 140
retrieving subsequent in dialog, 117
retrieving title, 239
retrieving user data, 196
setting focus, 96
setting title, 240
setting visibility, 98
Control class, 436
conventions, typesetting, v
converting
brush, 433
picture to opaque data, 302
coordinates, setting, 491
Count
from XVT_StrList, 352
count
from StrList, 511
CountAll
from XVT_List, 245
counting
controls in dialog, 116
elements in string list, 352
items in list box, 443
selected items in list box, 444

CountSelections
from XVT_List, 246
create
from DlgWin, 454
from ScreenWin, 500
create_def
from Control, 438
from DlgWin, 455
from ScreenWin, 501
create_scratch
from Control, 439
from ScreenWin, 502
creating
control, 438, 439
dialog, 454, 455
GUI object, 2
window, 500, 501, 502
cursor, setting shape, 57
CURSOR_* constants, 58

D

data, clipboard, 76, 78
dbg
from StrList, 512
deactivation, notifying object of, 418
Debug
from XVT_GlobalAPI, 185
from XVT_StrList, 352
Debug2
from XVT_GlobalAPI, 186
default directory, retrieving, 192
delegate objects, 2
Delete
from XVT_List, 246
deleting, paragraph, 373
DelPar
from XVT_TextEdit, 373
descent
retrieving, 28, 179
setting, 180
deselecting an item, 250
destroying
control, 92, 438
dialog, 109
window, 129
destructor, vii
dialog
about box, displaying, 183
creating, 454, 455
destroying, 109
determining visibility, 118
determining whether enabled, 116
disabling, 120
enabling, 120
initializing, 119
notifying object of creation, 111
notifying object of destruction, 112
page setup, displaying, 204
retrieving first control in, 117
retrieving number of controls, 116
retrieving subsequent controls, 117
retrieving title, 118
retrieving user data, 193
setting position, 121
setting size, 121
setting title, 122
setting visibility, 123
Difference
from XVT_Rct, 326
dimensions
retrieving for rectangle, 327
setting for rectangle, 495
directory
changing, 185
restoring, 206
retrieving, 172, 194
retrieving default, 192
saving, 207
setting, 173
startup, returning to, 224
DirToStr
from XVT_Directory, 126

disable
from BaseXVT, 425
from Menu Item, 483
disabling
control, 97
dialog, 120
menu item, 279, 483, 484
object, 425
window, 58
dispatch
from BaseWin, 408, 415
dispatching an event, 415
displaying
about box dialog, 183
alert box and terminating, 187
alert box with error icon, 186
alert box with note icon, 202
emergency message, 201
page setup dialog, 204
DLG_CANCEL control ID, 183
DLG_OK control ID, 183
DlgWin class, 3, 453
DoDraw function, 128
DoHScroll
from XVT_TextEdit, 374
downcasting, 10
DRAW_MODE enumeration, 33, 156
DrawAction, 128
from XVT_PrintWin, 311
DrawALine
from XVT_BaseDrawProto, 16
DrawArc
from XVT_BaseDrawProto, 17
DrawIcon, 217
from XVT_BaseDrawProto, 18
drawing
arc, 17, 469
icon, 18, 470
line, 16, 19, 471
oval, 19, 472
picture, 20
pie, 21, 473
polygon, 22, 473
polyline, 23, 474
rectangle, 23, 474
rounded rectangle, 24, 475
stop recording primitives, 302
text string, 25, 478
window, 128
drawing mode
retrieving, 27, 152, 461
setting, 33, 155, 461, 476
drawing tools
retrieving, 28, 470
setting, 34, 477
DrawInit
from XVT_PrintWin, 312
DrawLine
from XVT_BaseDrawProto, 19
DrawOval
from XVT_BaseDrawProto, 19
DrawPicture
from XVT_BaseDrawProto, 20
DrawPie
from XVT_BaseDrawProto, 21
DrawPolygon
from XVT_BaseDrawProto, 22
DrawPolyline
from XVT_BaseDrawProto, 23
DrawProtocol
from XVT_DrawableContainer, 128
from XVT_PrintWin, 310
DrawRect
from XVT_BaseDrawProto, 23
DrawRoundedRect
from XVT_BaseDrawProto, 24
DrawText
from XVT_BaseDrawProto, 25
DrawTools class, 459

E

e_action, 2, 253
    from XVT_Button, 42
    from XVT_ListBox, 254
    from XVT_LIstButton, 259
    from XVT_MenuItem, 274
    from XVT_ScrollBar, 49, 50, 338
    from XVT_Toggle, 394
e_activate
    from BaseWin, 416
e_char, 59, 62, 120, 123
    from XVT_Dialog, 109
    from XVT_DrawableContainer, 130
e_close, 129
    from XVT_Dialog, 111
    from XVT_TaskWin, 363
e_command
    from BaseWin, 416
e_control
    from BaseWin, 417
e_create, 1, 67, 68, 103, 114, 119, 136, 286, 362, 398, 402
    from XVT_Control, 93
    from XVT_Dialog, 111
    from XVT_DrawableContainer, 131
    from XVT_TaskWin, 363
e_deactivate
    from BaseWin, 418
e_destroy, 1, 93, 109, 111, 130, 363, 399
    from XVT_Control, 93
    from XVT_Dialog, 112
    from XVT_DrawableContainer, 132
    from XVT_TaskWin, 364
e_focus, 59, 111, 120, 123
    from XVT_Dialog, 112
    from XVT_DrawableContainer, 132
    from XVT_Editable, 162
e_font, 154, 175
    from XVT_MenuWin, 287
e_hscroll, 146
    from XVT_MenuWin, 49
e_mouse*, 59
e_mouse_*, 62
e_mouse_dbl
    from XVT_DrawableContainer, 133
e_mouse_down
    from XVT_DrawableContainer, 134
e_mouse_move, 62
    from XVT_DrawableContainer, 135
e_mouse_up
    from XVT_DrawableContainer, 135
e_quit, 367
    from XVT_TaskWin, 364
e_size
    from XVT_Dialog, 113
    from XVT_DrawableContainer, 136
e_timer, 390
    from XVT_Dialog, 114
    from XVT_DrawableContainer, 137
e_update, 30, 36, 128, 145, 154, 223
    from XVT_DrawableContainer, 137
e_user
    from XVT_Control, 94
    from XVT_Dialog, 115
    from XVT_DrawableContainer, 139
e_vscroll
    from XVT_MenuWin, 49
elt
    from StrList, 512
EM_* constants, 121, 146
emergency message, 201
emphasis, typesetting convention, v
empty
    from Rct, 494
enable
    from BaseXVT, 425
    from Menu item, 484
enabling
    control, 97
    dialog, 120
    menu item, 279, 484
    object, 425
    window, 58
entering help system, 199

EOL, finding, 188
EOL_* values, 188
EOL_SEQ constant, 75
Error
    from XVT_GlobalAPI, 186
error
    application, 187
    handling, 6, 167, 234
    raising, 9, 170, 237
event
    dispatching, 415
    notifying object of, 115, 139
    processing, 204
    user-defined, 94, 115
event delivery mask
    retrieving, 419
    setting, 420
event handlers, 2
event hook, 215
event mask
    constants, 146
    retrieving, 116, 141
    setting, 120, 146
event mask constants, 121

F

family
    from Font, 464
Fatal, 187
    from XVT_GlobalAPI, 187
Fatal function, 215
file
    determining if readable, 205
    opening, 203
    saving, 207
    setting type, 224
file name
    retrieving, 172
    setting, 174
    typesetting convention, v
file type
    retrieving, 173
    setting, 174
FindEOL
    from XVT_GlobalAPI, 188
FindEOL function, 75
finding EOL, 188
First
    from XVT_StrList, 353
first
    from StrList, 513
focus, notifying object of change, 112, 132
font
    from DrawTools, 460
    notifying object of change, 287
    retrieving, 152, 460
    retrieving size, 176
    selecting, 465
    setting, 34, 154, 419, 460, 476
    setting size, 176
Font class, 463
font family
    retrieving, 464
    setting, 464
font metrics, retrieving, 28, 503
font size
    retrieving, 466
    setting, 466
font structure, retrieving, 465
font style
    retrieving, 466
    setting, 466
foreground color
    retrieving, 152
    setting, 35, 155
format, clipboard, 74
freeing global memory, 197

G

GAlloc
    from XVT_GlobalAPI, 189
GC, 219
get
    from StrList, 408, 513
get_client
    from BaseWin, 418

get_config
from TaskWin, 520
get_def
from BaseXVT, 426
get_font
from Font, 465
get_mask
from BaseWin, 419
get_metrics
from ScreenWin, 503
get_rect
from BaseXVT, 426
get_scroll_pos
from Control, 440
get_scroll_proportion
from Control, 440
get_scroll_range
from Control, 441
get_text
from BaseXVT, 427
get_tools
from GraphWin, 470
get_type
from BaseXVT, 408, 427
get_win
from BaseWin, 419
GetAboutBoxID
from XVT_Config, 85
GetActiveTextEdit
from XVT_ChildBase, 50
GetAll
from XVT_List, 247
GetApplName
from XVT_Config, 85
GetAscent
from XVT_FontMetrics, 179
GetAttrib
from XVT_TextEdit, 375
GetAttrValue
from XVT_GlobalAPI, 190
GetBackColor
from XVT_DrawTools, 151
GetBaseApplName
from XVT_Config, 86
GetBlue
from XVT_Color, 81
GetBorder
from XVT_TextEdit, 375
GetBottomLeft
from XVT_Rct, 326
GetBottomRight
from XVT_Rct, 327
GetBrush
from XVT_BaseDrawProto, 26
from XVT_DrawTools, 151
GetCaretPos
from XVT_ChildBase, 50
GetCaretState
from XVT_ChildBase, 51
GetCheckableState
from XVT_MenuItem, 275
GetCheckedState
from XVT_MenuItem, 275
from XVT_Toggle, 394
GetClip
from XVT_BaseDrawProto, 26
GetClipState
from XVT_BaseDrawProto, 27
GetColor
from XVT_Brush, 38
from XVT_Pen, 296
GetCount
from XVT_Menu, 270
GetCtl
from XVT_Dialog, 115
from XVT_DrawableContainer, 140
GetCtlCount
from XVT_Dialog, 116
from XVT_DrawableContainer, 140
GetCurrentPoint
from XVT_BaseDrawProto, 27
GetData
from XVT_ClipBoard, 76

GetDefaultBackColor
from XVT_GlobalAPI, 191
GetDefaultDir
from XVT_GlobalAPI, 192
GetDescent
from XVT_FontMetrics, 179
GetDialogUserData
from XVT_GlobalAPI, 193
GetDimVect
from XVT_Rct, 327
GetDir, 192
from XVT_FileSpec, 172
from XVT_GlobalAPI, 194
GetDrawMode
from XVT_BaseDrawProto, 27
GetDrawTools, 154, 175
from XVT_BaseDrawProto, 28
GetElement
from XVT_List, 247
from XVT_StrList, 353
GetEnabledState
from XVT_ChildBase, 51
from XVT_Control, 95
from XVT_Dialog, 116
from XVT_MenuNode, 278
GetEventMask
from XVT_Dialog, 116
from XVT_DrawableContainer, 141
GetFirst
from XVT_Menu, 270
GetFirstCtl
from XVT_Dialog, 117
from XVT_DrawableContainer, 141
GetFirstSelection
from XVT_List, 248
GetFirstWin
from XVT_DrawableContainer, 142
from XVT_ScreenWin, 334
GetFont, 154
from XVT_DrawTools, 152
from XVT_TextEdit, 376
GetFontMetrics
from XVT_BaseDrawProto, 28, 178
GetForeColor
from XVT_DrawTools, 152
GetFrontTopLevelWin
from XVT_GlobalAPI, 191
GetFrontWin
from XVT_GlobalAPI, 192
GetGreen
from XVT_Color, 81
GetID
from XVT_Control, 95
GetInnerRect
from XVT_Base, 12
GetInterval
from XVT_Timer, 392
GetItem
from XVT_Menu, 270
GetLeading
from XVT_FontMetrics, 180
GetLimit
from XVT_TextEdit, 376
GetLine
from XVT_TextEdit, 376
GetLockedState
from XVT_Picture, 302
GetMargin
from XVT_TextEdit, 377
GetMenu
from XVT_MenuWin, 287
GetMenuBarID
from XVT_Config, 86
GetMenuUserData
from XVT_GlobalAPI, 194
GetMKey
from XVT_MenuNode, 278
GetMode
from XVT_DrawTools, 152
GetName
from XVT_FileSpec, 172
GetNext
from XVT_Menu, 271

GetNextCtl
from XVT_Dialog, 117
from XVT_DrawableContainer, 142
GetNextWin
from XVT_DrawableContainer, 143
from XVT_ScreenWin, 334
GetNumChars
from XVT_TextEdit, 378
GetNumLines
from XVT_TextEdit, 378
GetNumParLines
from XVT_TextEdit, 379
GetNumPars
from XVT_TextEdit, 379
GetOpaqueData
from XVT_Picture, 302
GetOpaqueDataSize, 303
from XVT_Picture, 303
GetOpaqueText
from XVT_DrawTools, 153
GetOpenState
from XVT_ClipBoard, 77
from XVT_Picture, 304
GetOrigin
from XVT_TextEdit, 380
GetOuterRect
from XVT_Base, 13
GetOutputFile
from XVT_PrintWin, 312
GetParent
from XVT_ChildBase, 51
from XVT_Control, 95
from XVT_MenuNodeBase, 282
GetPattern
from XVT_Brush, 38
from XVT_Pen, 296
GetPen
from XVT_BaseDrawProto, 28
from XVT_DrawTools, 153
GetPrintRcd
from XVT_PrintWin, 313
GetPrintRcdSize
from XVT_PrintWin, 313
GetRed
from XVT_Color, 82
GetResString
from XVT_GlobalAPI, 195
GetScrollPosition
from XVT_ScrollBar, 339
fromXVT_ChildBase, 52
GetScrollProportion
from XVT_ChildBase, 52
from XVT_ScrollBar, 340
GetScrollRange
from XVT_ChildBase, 53
from XVT_ScrollBar, 340
GetSel
from XVT_TextEdit, 380
GetSelectedState
from XVT_List, 248
GetSelectionIndex
from XVT_List, 249
GetSelections
from XVT_List, 249
GetSize
from XVT_Font, 176
GetStyle
from XVT_Pen, 296
GetSubMenuPtr
from XVT_SubMenu, 357
GetSuspendedState
from XVT_ListBox, 254
GetTaskWinTitle
from XVT_Config, 87
GetTextEdit
from XVT_ChildBase, 54
GetTextWidth, 211, 212
from XVT_BaseDrawProto, 29
GetTitle
from XVT_Dialog, 118
from XVT_Label, 239
from XVT_MenuNode, 278
from XVT_MenuWin, 288

GetTopLeft
from XVT_Rct, 327
GetTopRight
from XVT_Rct, 328
GetType
from XVT_Base, 13
from XVT_FileSpec, 173
GetView
from XVT_TextEdit, 381
GetVisibleState
from XVT_ChildBase, 54
from XVT_Control, 96
from XVT_Dialog, 118
GetWidth
from XVT_Pen, 297
GetWinCount
from XVT_DrawableContainer, 143
from XVT_ScreenWin, 335
GetWindowUserData
from XVT_GlobalAPI, 196
GetX
from XVT_Pnt, 307
GetY
from XVT_Pnt, 307
GFree
from XVT_GlobalAPI, 197
GHANDLE, 189
global memory
allocating, 189
freeing, 197
locking, 197
resizing, 198
retrieving size of block, 198
unlocking, 199
GLock
from XVT_GlobalAPI, 197
Grafport, 219
GraphWin class, 468
GReAlloc
from XVT_GlobalAPI, 198
green
retrieving color component, 81
setting color component, 82
GSize
from XVT_GlobalAPI, 198
gstrcat, 75
GUnLock
from XVT_GlobalAPI, 199

H

Handler, 233
from XVT_AllocErrorHandler, 6
from XVT_ErrorHandle, 167
from XVT_InternalErrorHandler, 234
handlers, 2
handling
error, 167
internal error, 234
memory allocation error, 6
HDC, 219
header file, vi
Height
from XVT_Rct, 328
heirarchy of classes, 3
Help
from XVT_GlobalAPI, 199
hide
from BaseXVT, 428
hiding an object, 428, 430
horizontal scrollbar, notifying object of activity, 49
HPS, 219
HWND, 220

I

icon
drawing, 18, 470
from GraphWin, 470
initializing, 230
ID
control's, retrieving, 95, 441
resource's, retrieving, 85, 86
resource's, setting, 87, 89

id
    from Control, 441
IDT, 1
if statement, 2
implementation class, vi
implementation members, viii
inherited member function, viii
Init
    from XVT_ChildWin, 67
    from XVT_Control, 96, 230, 240, 250, 341
    from XVT_DetachedWin, 102
    from XVT_Dialog, 119
    from XVT_Icon, 230
    from XVT_Label, 239
    from XVT_PrintWin, 314
    from XVT_ScrollBar, 341
    from XVT_TaskWin, 366
    from XVT_TextEdit, 382
    from XVT_TopLevelWin, 401
initializing
    child window, 67
    control, 96
    dialog, 119
    icon, 230
    label, 239
    print window, 314
    scrollbar, 341
    task window, 366
    text edit object, 382
    top-level window, 401
    window, 102
inner rectangle
    retrieving, 12
    setting for control, 98
    setting for dialog, 121
Install
    from XVT_Menu, 271
installing
    item in menu, 271
Interactive Design Tool, 1
Intersect
    from XVT_Rct, 328
Invalidate, 138
    from XVT_BaseDrawProto, 144
invalidating
    area, 144
    disjoint areas of the window, 139
invisibility
    determining for control, 96
    determining for dialog, 118
    determining for window, 54
    retrieving for caret, 51
    setting for caret, 57
    setting for dialog, 123
    setting for window, 61
is_checked
    from Control, 441
IsEmpty
    from XVT_Rct, 329

K

key, accelerator, 278

L

label, initializing, 239
lbox_add
    from Control, 442
lbox_clear
    from Control, 443
lbox_count_all
    from Control, 443
lbox_count_sel
    from Control, 444
lbox_delete
    from Control, 444
lbox_get_all
    from Control, 444
lbox_get_elt
    from Control, 445
lbox_get_first_sel
    from Control, 445
lbox_get_sel
    from Control, 446
lbox_get_sel_index
    from Control, 446

lbox_is_sel
from Control, 447
lbox_resume
from Control, 447
lbox_set_sel
from Control, 448
lbox_suspend
from Control, 448
leading
retrieving, 28, 180
setting, 181
left
from Rct, 494
line
drawing, 16, 19, 471
from GraphWin, 471
line-end sequence, 188
list
adding elements, 510
adding items, 244, 263
removing item, 246
removing items, 245
retrieving all items, 247
retrieving item, 247
retrieving number of elements, 511
retrieving number of items, 245
list box
adding items, 442
determining if updates are suspended, 254
notifying object of activity, 254
removing all items, 443, 444
removing item, 444
resuming updates, 255, 447
retrieving all selected items, 446
retrieving first selected item, 248, 445
retrieving index of first selected item, 446
retrieving number of items, 443
retrieving number of selected items, 444
suspending updates, 255, 448
list button, notifying object of activity, 259
ListFaces
from XVT_GlobalAPI, 200
listing typefaces, 200
ListResStrings
from XVT_GlobalAPI, 201
Lock
from XVT_Picture, 304
locking
global memory, 197
picture data, 304
longjmp, 167

M

M_* (drawing modes), 33, 156
MakeFront, 113, 133
from XVT_ChildBase, 55
from XVT_Control, 96
member function, vii
description format, viii
inherited, viii
memory
allocating, 189
freeing, 197
locking, 197
resizing, 198
retrieving size of global block, 198
unlocking, 199
memory allocation errors, 6
menu
checking item, 275
determining if enabled, 278
determining if item is checkable, 275
determining if item is checked, 275
disabling item, 279
enabling item, 279
installing item, 271
notifying object of selection, 274, 416
replacing default item, 272
retrieving, 287
retrieving accelerator key, 278
retrieving first item, 270
retrieving item, 270
retrieving number of items, 270
retrieving parent, 282
retrieving subsequent items, 271

setting, 290
unchecking item, 275
menu item
checking, 483
disabling, 483, 484
enabling, 484
retrieving tag, 484
retrieving user data, 194
unchecking, 483, 484
menubar
retrieving resource ID, 86
setting resource ID, 89
MenuItem class, 482
Message, 187
from XVT_GlobalAPI, 201
message, emergency, 201
metrics, font, 503
mode
drawing, 27, 33, 152, 155, 461, 476
from DrawTools, 461
mouse
notifying object of double click, 133
notifying object of down event, 134
notifying object of move, 135
notifying object of up event, 135
releasing, 55
trapping, 62
move
from BaseXVT, 428
move_to
from GraphWin, 472
moving
current position, 472
object, 428
MyButton, 391

N

NeedsUpdate
from XVT_BaseDrawProto, 30
Next
from XVT_StrList, 354
next
from StrList, 514
Normalize
from XVT_Rct, 12, 329
Note
from XVT_GlobalAPI, 202

O

object
closing, 425
disabling, 425
enabling, 425
hiding, 428, 430
moving, 428
retrieving, 140
retrieving title, 427
setting title, 429
showing, 430
offset, retrieving for view rectangle, 380
opaque data, determining buffer size, 303
opaque text flag
retrieving, 153
setting, 156
Open
from XVT_ClipBoard, 77
OpenFile, 200
from XVT_GlobalAPI, 203
opening
clipboard, 77
file, 203
operator, vii
outer rectangle, retrieving, 13, 426
output file
retrieving, 312
retrieving name, 311
setting name, 314
oval
drawing, 19, 472
from GraphWin, 472
overloaded operator, vii

P

page, printing another, 311
PageSetup, 309
from XVT_GlobalAPI, 204

parent
from BaseXVT, 428
parent window, retrieving, 51, 95, 428
pat
from Brush, 434
from Pen, 487
PAT_STYLE enumeration, 39, 298
pattern
retrieving for brush, 38, 434
retrieving for pen, 296, 487
setting for brush, 39, 434
setting for pen, 297, 487
pen
from DrawTools, 461
retrieving, 28, 153, 461
retrieving color, 296, 487
retrieving pattern, 296, 487
retrieving position, 27
retrieving style, 296
retrieving width, 297, 488
setting, 36, 157, 461, 477
setting color, 297, 487
setting pattern, 297, 487
setting position, 32
setting style, 298
setting width, 299, 488
Pen class, 486
pen position, 32
picture
converting to opaque data, 302
determining if locked, 302
determining if open, 304
drawing, 20
picture data
locking, 304
unlocking, 304
pie
drawing, 21, 473
from GraphWin, 473
Pnt class, 490
point, translating, 225
pointer
to screen window, 11
to task window, 12
polygon
drawing, 22, 473
from GraphWin, 473
polyline
drawing, 23, 474
from GraphWin, 474
polymorphism, 3
position
moving, 472
retrieving for pen, 27
setting for pen, 32
setting for window, 148
print record
retrieving, 313
retrieving size, 313
setting, 315
validating, 315
print window, initializing, 314
printer, 221
printing, 312
ProcessEvents
from XVT_GlobalAPI, 204
processing pending events, 204
put_def
from BaseXVT, 429
PutData
from XVT_ClipBoard, 78

Q

QuitOK
from XVT_TaskWin, 367
quitting
application, 367
notifying object of request, 364

R

radio button, 212
checking, 437
determining if checked, 441
setting, 320

Raise, 167
from XVT_AllocErrorManager, 9
from XVT_ErrorManager, 170
from XVT_InternalErrorManager, 237
raising
error, 9, 170
internal error, 237
Rct class, 493
ReadAccess
from XVT_GlobalAPI, 205
rectangle
computing difference, 326
computing intersection, 328
constraining a point to, 324
determining contents, 325
determining if empty, 329, 494
drawing, 23, 474
from GraphWin, 474
retrieving, 12, 13, 426
retrieving dimensions, 327
retrieving height, 328
retrieving lower left, 326
retrieving lower right, 327
retrieving upper left, 327
retrieving upper right, 328
retrieving width, 332
setting dimensions, 495
setting lower left, 330
setting lower right, 330
setting upper left, 330
setting upper right, 331
rectangular region, scrolling, 145
red
retrieving color component, 82
setting color component, 83
ReleaseMouse
from XVT_ChildBase, 55
releasing the mouse, 55
rem
from StrList, 514
Remove
from XVT_StrList, 355
removing
all items from list, 245
all items from list box, 443, 444
element from string list, 355, 514
item from list, 246
item from list box, 444
text from text edit object, 373
Replace
from XVT_Menu, 272
replacing default menu item, 272
resizing global memory, 198
resource ID
retrieving, 85, 86
retrieving strings by, 201
setting, 87, 89
Response
from XVT_GlobalAPI, 206
RestoreDir
from XVT_GlobalAPI, 206
restoring directory, 206
resuming updates to list box, 255, 447
retrieving
active text edit, 50
all items from list, 247
all selected items, 249
all selected items from list box, 446
application base name, 86
application configuration data, 520
application name, 85
ascent, 179
background color, 151, 191
blue color component, 81
bottom of rectangle, 494
brush, 26, 151, 460
brush color, 38, 434
brush pattern, 38, 434
caret position, 50
caret visibility, 51
client area, 418
client area boundary, 12
clipboard data, 76
clipping rectangle, 26

clipping state, 27
container event mask, 141
contents of string list, 512
contents of text line, 376
control, 115
control ID, 95, 441
control object, 140
control title, 239
default directory, 192
descent, 179
dialog title, 118
directory, 172, 194
drawing mode, 27, 152, 461
drawing tools, 28, 470
element from string list, 353
element in a string list, 513
event delivery mask, 419
event mask, 116
file name, 172
file type, 173
first child window, 142, 334
first control, 141
first control in a dialog, 117
first menu item, 270
first selected item from list box, 248, 445
font, 152, 460
font family, 464
font metrics, 28, 503
font size, 176, 466
font structure, 465
font style, 466
foreground color, 152
frontmost top-level window, 191
frontmost window, 192
green color component, 81
index of first selected item, 249
index of first selected item in list box, 446
item from list, 247
leading, 180
left edge of rectangle, 494
menu, 287
menu accelerator key, 278
menu item, 270
menu item tag, 484
menu item title, 278
next child window, 143, 334
next control, 142
next element in string list, 354, 514
nonportable string directory specification, 126
number of characters in text edit line, 378
number of child windows, 143, 335
number of controls, 140
number of controls in dialog, 116
number of elements in list, 511
number of elements in string list, 352
number of items in list, 245
number of items in list box, 443
number of lines in text edit object, 378
number of lines in text edit paragraph, 379
number of menu items, 270
number of paragraphs in text edit object, 379
number of selected items, 246
number of selected items in list box, 444
object title, 427
offset to view rectangle, 380
opaque text flag, 153
outer rectangle, 13, 426
output file, 312
output file name, 311
parent menu, 282
parent window, 51, 95, 428
pen, 28, 153, 461
pen color, 296, 487
pen pattern, 296, 487
pen position, 27
pen style, 296
pen width, 297, 488
print record, 313
rectangle dimensions, 327
rectangle height, 328
rectangle lower left, 326
rectangle lower right, 327
rectangle upper left, 327

rectangle upper right, 328
rectangle width, 332
red color component, 82
resource ID, 85, 86
right edge of rectangle, 495
scrollbar position, 52
scrollbar range, 53, 340, 441
size of global block, 198
size of print record, 313
strings from resources, 195
strings with consecutive resource IDs, 201
submenu pointer, 357
subsequent controls in a dialog, 117
subsequent menu items, 271
system attribute value, 190
task window title, 87
text edit object, 54
text edit object attributes, 375
text edit object border, 375
text edit object character limit, 376
text edit object font, 376
text edit object margin, 377
text edit selection, 380
text string width, 29
thumb position, 339
thumb proportion, 52, 340, 440
timer interval, 392
toggle state, 394
top of rectangle, 496
user data for control, 196
user data for dialog, 193
user data for menu item, 194
view rectangle, 381
window definition, 426
window handle, 419
window title, 288
window type, 13, 427
x coordinate, 307, 491
y coordinate, 307, 492
returning to startup directory, 224
right
from Rct, 495
rounded rectangle, drawing, 24, 475
rounded_rectangle
from GraphWin, 475

S

SaveDir
from XVT_GlobalAPI, 207
SaveFile
from XVT_GlobalAPI, 207
saving
directory, 207
file, 207
SC_* (scroll control), 339
screen, 222
screen window, 11
ScreenWin class, 3, 498
Scroll, 138
from XVT_BaseDrawProto, 145
SCROLL_CONTROL enumeration, 339
scrollbar
initializing, 341
notifying object of activity, 49, 338
retrieving position, 52
scrollbar range
retrieving, 53, 340, 441
setting, 60, 343, 450
scrolling
rectangular region, 145
text edit, horizontally, 374
select_text
from Control, 449
selecting
font, 465
item, 250
text, 449
set
from Pnt, 491
from Rct, 408, 495
set_brush
from GraphWin, 475
Set_Checked_State, 394

set_def
from DlgWin, 408, 455
from ScreenWin, 408, 503
set_font
from BaseWin, 419
from Font, 408, 465
from GraphWin, 476
set_mask
from BaseWin, 420
set_mode
from GraphWin, 476
set_pen
from GraphWin, 477
set_scroll_pos
from Control, 449
set_scroll_proportion
from Control, 450
set_scroll_range
from Control, 450
set_text
from BaseXVT, 429
set_timer
from BaseWin, 408, 420
set_tools
from GraphWin, 477
SetAboutBoxID
from XVT_Config, 87, 183
SetActive
from XVT_TextEdit, 384
SetApplName
from XVT_Config, 88
SetAscent
from XVT_FontMetrics, 180
SetAttrValue
from XVT_GlobalAPI, 110, 131, 208
SetBackColor
from XVT_BaseDrawProto, 30
from XVT_DrawTools, 153
SetBaseApplName
from XVT_Config, 88
SetBlue
from XVT_Color, 82
SetBottomLeft
from XVT_Rct, 330
SetBottomRight
from XVT_Rct, 330
SetBrush
from XVT_BaseDrawProto, 31
from XVT_DrawTools, 154
SetCaretDimensions
from XVT_ChildBase, 56
SetCaretPos
from XVT_ChildBase, 56
SetCaretState
from XVT_ChildBase, 57
SetCheckedState
from XVT_CheckBox, 45
from XVT_MenuItem, 275
from XVT_RadioButton, 320
SetClip
from XVT_BaseDrawProto, 31
SetClipState
from XVT_BaseDrawProto, 32
SetColor
from XVT_Brush, 39
from XVt_Pen, 297
SetCurrentPoint
from XVT_BaseDrawProto, 32
SetCursor
from XVT_ChildBase, 57
SetDescent
from XVT_FontMetrics, 180
SetDir
from XVT_FileSpec, 173
SetDocTitle, 88, 402
from XVT_MenuWin, 289
SetDrawMode
from XVT_BaseDrawProto, 33
SetDrawTools
from XVT_BaseDrawProto, 34

SetEnabledState
from XVT_ChildBase, 58
from XVT_Control, 97
from XVT_Dialog, 120
from XVT_MenuNode, 279
SetEventMask
from XVT_Dialog, 120
from XVT_DrawableContainer, 146
SetFileType
from XVT_GlobalAPI, 224
SetFont
from XVT_BaseDrawProto, 34
from XVT_DrawTools, 154
SetFontMenu
from XVT_MenuWin, 289
SetForeColor
from XVT_BaseDrawProto, 35
from XVT_DrawTools, 155
SetGreen
from XVT_Color, 82
SetInnerRect, 114, 137
from XVT_Control, 98
from XVT_Dialog, 121
from XVT_DrawableContainer, 148
setjmp, 168
SetLeading
from XVT_FontMetrics, 181
SetMenu
from XVT_MenuWin, 290
SetMenuBarID
from XVT_Config, 89
SetMode
from XVT_DrawTools, 155
SetName
from XVT_FileSpec, 174
SetOpaqueText
from XVT_DrawTools, 26, 156
SetOutputFile
from XVT_PrintWin, 314
SetPattern
from XVT_Brush, 39
from XVT_Pen, 297
SetPen
from XVT_BaseDrawProto, 36
from XVT_DrawTools, 157
SetPrintRecord
from XVT_PrintWin, 315
SetRed
from XVT_Color, 83
SetScrollPosition
from XVT_ChildBase, 59
from XVT_ScrollBar, 342
SetScrollProportion
from XVT_ChildBase, 60
from XVT_ScrollBar, 342
SetScrollRange
from XVT_ChildBase, 60
from XVT_ScrollBar, 343
SetSelectedState
from XVT_List, 250
SetSize
from XVT_Font, 176
SetStyle
from XVT_Pen, 298
SetSubMenuPtr
from XVT_SubMenu, 357
SetSuspendedState
from XVT_ListBox, 255
SetTaskWinTitle
from XVT_Config, 89
setting
application base name, 88
application name, 88
ascent, 180
attribute value, 208
background color, 30, 153
blue color component, 82
brush, 31, 154, 460, 475
brush color, 39, 434
brush pattern, 39, 434
caret dimensions, 56
caret position, 56
caret visibility, 57
clipping region, 31

clipping state, 32
container event mask, 146
control dimensions, 98
control title, 240
coordinates, 491
descent, 180
dialog position, 121
dialog size, 121
dialog title, 122
directory, 173
drawing mode, 33, 155, 461, 476
drawing tools, 34, 477
event delivery mask, 420
event mask, 120
file name, 174
file type, 174, 224
font, 34, 154, 419, 460, 476
font family, 464
font menu checkmarks, 289
font size, 176, 466
font style, 466
foreground color, 35, 155
green color component, 82
leading, 181
menu, 290
menu item title, 279
object title, 429
opaque text flag, 156
output file name, 314
pen, 36, 157, 461, 477
pen color, 297, 487
pen pattern, 297, 487
pen position, 32
pen style, 298
pen width, 299, 488
print record, 315
radio button, 320
rectangle dimensions, 495
rectangle lower left, 330
rectangle lower right, 330
rectangle upper left, 330
rectangle upper right, 331
red color component, 83
resource ID, 87, 89
scrollbar range, 60, 343, 450
submenu pointer, 357
task window title, 89
thumb position, 59, 342, 440, 449
thumb proportion, 60, 342, 450
timer, 420
WIN_DEF structure, 455, 503
window cursor shape, 57
window definition, 429
window position, 148
window size, 148
window title, 289, 291
x coordinate, 308, 491
y coordinate, 308, 492
SetTitle, 402
from XVT_Dialog, 122
from XVT_Label, 240
from XVT_MenuNode, 279
from XVT_MenuWin, 291
SetTopLeft
from XVT_Rct, 330
SetTopRight
from XVT_Rct, 331
SetType
from XVT_FileSpec, 174
SetVisibleState
from XVT_ChildBase, 61
from XVT_Control, 98
from XVT_Dialog, 123
SetWidth
from XVT_Pen, 299
SetX
from XVT_Pnt, 308
SetY
from XVT_Pnt, 308
show
from BaseXVT, 430
showing an object, 430
SHRT_MAX, 59, 61
SHRT_MIN, 59, 61

size
from Font, 466
notifying object of change, 113, 136
setting for window, 148
SLIST, 445, 446
source file, vi
starting an XVT++ application, 520
startup directory, returning to, 224
StartupDir
from XVT_GlobalAPI, 224
strcat, 75
string
getting from user, 206
retrieving, 195, 201
text, 25, 478
string list
adding items, 350
adding to in order, 351, 511
appending to debug file, 352
determining if valid, 515
removing element, 355, 514
retrieving contents, 512
retrieving element, 353, 513
retrieving next element, 354, 514
retrieving number of elements, 352
traversing, 353, 513
writing to debug file, 512
StrList class, 509
StrListElt class, 517
style
from Font, 466
retrieving for pen, 296
setting for pen, 298
subclass, vi
submenu
retrieving pointer, 357
setting pointer, 357
superclass, vi
suspending updates to list box, 255, 448
switch statement, 2
system attribute
retrieving value, 190
setting, 208

T

tag
from MenuItem, 484
task window, 12
initializing, 366
retrieving title, 87
setting title, 89
TaskWin class, 518
terminating, 187
text
from GraphWin, 478
selecting, 449
text edit
attribute flags, 382
retrieving, 50
retrieving selection, 380
scrolling horizontally, 374
text edit object
adding paragraph, 371
deleting paragraph, 373
initializing, 382
removing text, 373
retrieving, 54
retrieving attributes, 375
retrieving border, 375
retrieving character limit, 376
retrieving contents of line, 376
retrieving font, 376
retrieving margin, 377
retrieving number of characters in line, 378
retrieving number of lines, 378
retrieving number of paragraphs, 379
text flag
retrieving, 153
setting, 156
text string
drawing, 25, 478
retrieving width, 29

thumb position
retrieving, 339
setting, 59, 342, 440, 449
thumb proportion
retrieving, 52, 340, 440
setting, 60, 342, 450
timer
notifying object of expiration, 114, 137
retrieving interval, 392
setting, 420
title
retrieving, 427
retrieving for control, 239
retrieving for dialog, 118
retrieving for menu item, 278
retrieving for window, 288
setting, 429
setting for control, 240
setting for dialog, 122
setting for menu item, 279
setting for window, 289, 291
title bar, 223
toggle
notifying object of activity, 394
retrieving state, 394
tools.h, 81
top
from Rct, 496
top-level window
initializing, 401
retrieving, 191
TranslatePoints
from XVT_GlobalAPI, 225
translating
point, 225
point relative to origin, 332
point relative to rectangle, 331
TransToGlobal
from XVT_Rct, 331
TransToLocal
from XVT_Rct, 332
TrapMouse
from XVT_ChildBase, 62
trapping the mouse, 62
traversing a string list, 353, 513
TX_* flags, 382
TX_ONEPAR, 376
typefaces, listing, 200
typesetting conventions, v

U

UCHAR_MAX, 110
UCHAR_MAX constant, 110, 131
uncheck
from Control, 451
from MenuItem, 484
unchecking
check box, 45
checkbox, 451
menu item, 275, 483, 484
Unlock
from XVT_Picture, 304
unlocking
global memory, 199
picture data, 304
unselecting an item, 250
UpdateWindow, 139
from XVT_BaseDrawProto, 36
updating
list box, 447
window, 36
url.h, 183
user
asking a question of, 183
getting a string from, 206
user-defined cursor, 58
user-defined event, 94, 115
using XVT++, 1

V

valid
from StrList, 408, 515
ValidatePrintRcd, 204
from XVT_PrintWin, 315

validating print record, 315
vertical scrollbar, notifying object of activity, 49
view rectangle
    retrieving, 381
    retrieving offset, 380
visibility
    determining for control, 96
    determining for dialog, 118
    determining for window, 54
    retrieving for caret, 51
    setting for caret, 57
    setting for control, 98
    setting for dialog, 123
    setting for window, 61

W

W_DBL, 102, 401
W_DOC, 102, 401
W_NO_BORDER, 67
W_PLAIN, 67, 102, 401
WD_MODAL, 454
WD_MODELESS, 454
Width
    from XVT_Rct, 332
width
    from Pen, 488
    retrieving for pen, 297, 488
    retrieving for rectangle, 332
    retrieving for text string, 29
    setting for pen, 299, 488
WIN_DEF structure, 439
    creating control from, 438
    creating window from, 501
    setting, 455, 503
window
    clearing, 129, 470
    creating, 500, 501, 502
    destroying, 129
    determining if area needs drawing, 30
    determining visibility, 54
    determining whether enabled, 51
    disabling, 58
    drawing, 128
    enabling, 58
    giving focus, 55
    initializing, 102
    initializing child, 67
    initializing top level, 401
    moving to front, 55
    notify object of invalidation, 137
    retrieving caret position, 50
    retrieving child, 334
    retrieving definition, 426
    retrieving first child, 142
    retrieving frontmost, 192
    retrieving handle, 419
    retrieving next child, 143, 334
    retrieving number of children, 143, 335
    retrieving parent, 51, 95
    retrieving title, 288
    retrieving top level, 191
    retrieving type, 13, 427
    setting caret dimensions, 56
    setting caret position, 56
    setting cursor shape, 57
    setting definition, 429
    setting position, 148
    setting size, 148
    setting title, 289, 291
    setting visibility, 57, 61
    updating, 36
Window, native X, 220
Windowptr, 220
writing string list to debug file, 512
WSF_HSCROLL, 212
WSF_VSCROLL, 213

X

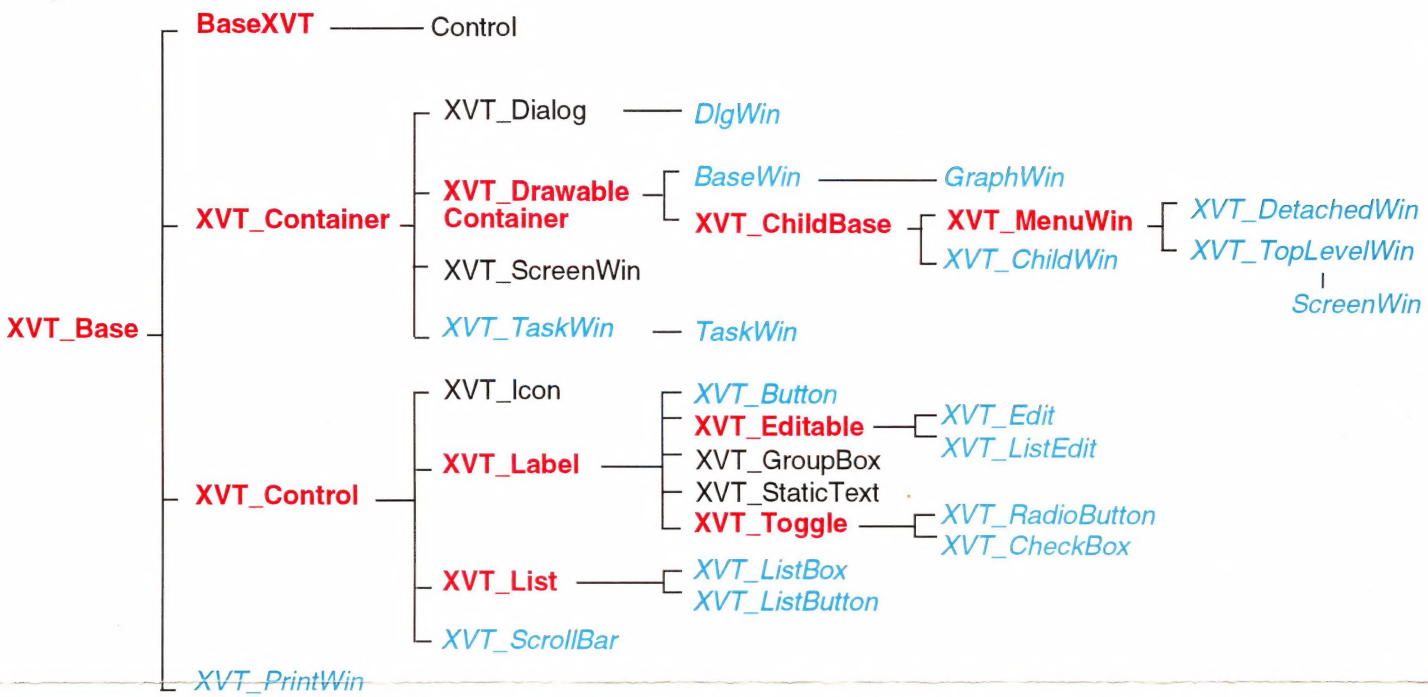
x
    from Pnt, 491
x coordinate
    retrieving, 307, 491
    setting, 308, 491
XVT Portability Toolkit, 1
XVT/CH, 16, 17, 18, 19, 20, 21, 22, 23, 25, 35, 56, 58, 110, 131, 155, 204, 209, 303, 313,

315, 342, 343
XVT/Mac, 18, 20, 55, 110, 131, 189, 203, 205, 208, 209, 224, 303, 316, 343
XVT/PM, 18, 20, 101, 110, 131, 144, 205, 209, 210, 303, 314, 316, 366
XVT/Win, 18, 20, 55, 101, 110, 131, 144, 190, 205, 209, 303, 316, 366
XVT/XM, 18, 122, 148, 204, 210, 313, 315
XVT/XOL, 20, 204, 210, 313, 315
XVT_AllocError global variable, 8
XVT_AllocErrorHandler class, 5
XVT_AllocErrorManager class, 8
XVT_Base class, 10
XVT_BaseDrawProto class, 15
XVT_Brush class, 37
XVT_Button class, 41, 97
XVT_CB global variable, 72
XVT_CheckBox class, 44, 97
XVT_ChildBase class, 48
XVT_ChildWin class, 66
XVT_ClipBoard class, 72
XVT_Color class, 80
XVT_Color object, 80, 191
XVT_Config class, 84
XVT_Config instance, 200, 289
XVT_Config structure, 183
XVT_Container class, 90
XVT_Control class, 92
XVT_DetachedWin class, 1, 101, 498
XVT_Dialog class, 1, 108
XVT_Directory class, 125
XVT_Directory instance, 171
XVT_DrawableContainer class, 3, 127, 391
XVT_DrawTools class, 37, 150, 459
XVT_Edit class, 158
XVT_Editable class, 161
XVT_ErrorHandler class, 166
XVT_ErrorManager class, 166, 169
XVT_FileSpec class, 171
XVT_Font class, 175, 463
XVT_FontMetrics class, 178
XVT_GlobalAPI class, 182
XVT_GroupBox class, 226
XVT_Icon class, 229
XVT_INTERNAL_ERROR macro, 237
XVT_InternalError global variable, 236
XVT_InternalErrorHandler class, 233
XVT_InternalErrorManager class, 236
XVT_Label class, 238, 346
XVT_List class, 243
XVT_ListBox class, 253
XVT_ListButton class, 258
XVT_ListEdit class, 262
xvt_malloc function, 218
XVT_Menu class, 267, 482
XVT_Menu structure, 267
XVT_MenuItem class, 273, 482
XVT_MenuNode class, 277
XVT_MenuNodeBase class, 281
XVT_MenuSeparator class, 283
XVT_MenuWin class, 285
XVT_Pen class, 295, 486
XVT_Picture class, 300
XVT_Picture type, 75
XVT_Pnt class, 306, 490
XVT_PrintWin class, 309
XVT_RadioBtnGroup instance, 318
XVT_RadioButton class, 318
XVT_Rct class, 323, 493
xvt_realloc function, 218
XVT_ScreenWin class, 333
XVT_ScrollBar class, 337
XVT_StrList, 509
XVT_StrList class, 517
XVT_Strlist class, 349
XVT_SubMenu class, 356
XVT_TaskWin class, 1, 359, 518
XVT_TextEdit class, 370
XVT_Timer class, 390
XVT_Timer instance, 137
XVT_Toggle class, 393
XVT_TopLevelWin class, 101, 397, 498
XVT_ToplevelWin class, 1
XVTDEBUG file, 186

Y

y
    from Pnt, 492
y coordinate
    retrieving, 307, 492
    setting, 308, 491, 492

XVT++ 2.0 Class Hierarchy



XVT_Brush — Brush
XVT_DrawTools — DrawTools
XVT_ErrorHandler — XVT_AllocErrorHandler, XVT_InternalErrorHandler
XVT_ErrorManager — XVT_AllocErrorManager, XVT_InternalErrorManager
XVT_Font — Font
XVT_MenuNodeBase — XVT_MenuNode — XVT_MenuItem, XVT_SubMenu; XVT_MenuSeparator
XVT_Pen — Pen
XVT_Pnt — Pnt
XVT_Rct — Rct
XVT_StrList — StrList

Standalone Classes

MenuItem
StrListElt
XVT_BaseDrawProto
XVT_ClipBoard
XVT_Color
XVT_Config
XVT_Directory
XVT_FileSpec
XVT_FontMetrics
XVT_GlobalAPI
XVT_Menu
XVT_Picture
XVT_RadioBtnGroup
XVT_TextEdit
XVT_Timer

Key

Concrete Class
Abstract Class
Implementation Class